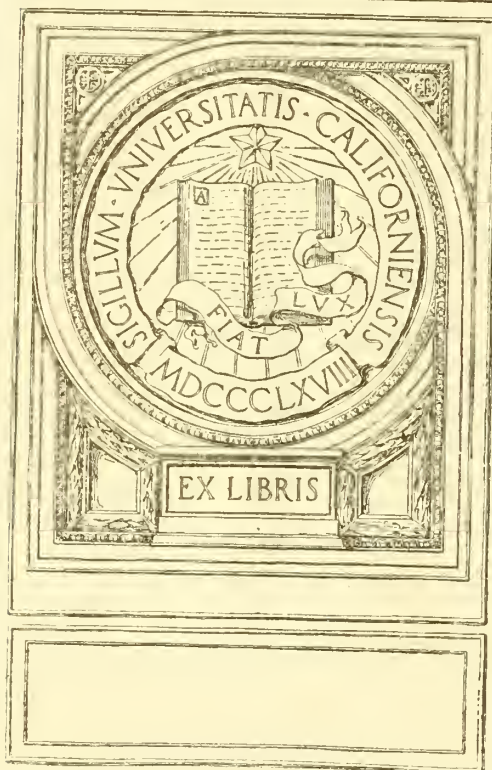


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ORIGINAL ARTICLES

THE TREATMENT OF SIMPLE CASES OF DIABETES*

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In order to appreciate better the use of insulin in the treatment of diabetes mellitus without complication, we should first review the dietary progress made in the disease during the last few years. Certain fundamental principles have been laid down which have increased our success. Unless these facts are considered in our treatment, insulin will not receive the result that it deserves. There are four main principles to be reviewed.

In the last few years although there has been a reaction against extreme undernourishment established in Allen's and in Joslin's important works in relation to total dietary restriction, yet we must never forget the important step these men took in this disease. In the end, Allen's and Joslin's work has left one necessary factor to consider, namely, the limit of total calories necessary for body maintenance for the individual.

Joslin reported that before 1914 diabetic patients usually had a higher basal metabolic rate than normal individuals of the same height and weight. After Joslin's routine had been established he found the rate below the standard selected by Benedict and Joslin. Later Allen verified this work in thirty-six patients which he studied. Both men felt that the two chief factors that governed the increased rate were diet and acidosis. Works by other men have not agreed entirely with these statements. If the patient is well nourished, and secondary factors, as infection, hyperthyroidism, high protein and caloric diets, can be eliminated, a higher rate than normal does not necessarily occur.

We realize also that acidosis under even lax diabetic supervision is usually more or less dependent on the same secondary factors as mentioned above. Out of this work, however, has emerged one definite idea, namely, that with the proper restriction of protein the metabolic rate can be brought below or even to normal, and thereby a diabetic patient can be made to burn his caloric intake or body tissues at a level more compatible to dietary restriction.

The second principle, namely protein restriction, has been developed from the work established out of the above results. A few years ago the physiologists were shocked when the clinician suggested the use of only one gram of protein per kilogram body weight in diabetic individuals. Newburgh and Marsh, however, suggested two-thirds of a gram of protein, and later Wilder and Boothby found that high protein intake definitely increased body metabolism in this disease. From this work it has been found that two-thirds of a gram of protein will generally maintain the adult patient in nitrogenous equilibrium. Today we also recognize that 58 per cent of the protein in the diet can be burned as glucose, which in the end may embarrass the body in its attempt to burn carbohydrates. In order to attain the low protein intake, however, and still maintain a nitrogenous balance the total caloric needs of the patient must be watched. Because of this fact, Newburgh and Marsh had their good results with the so-called high fat diet.

The third principle is based on clinical evidence, namely, that the pancreas should attempt to handle only the amount of carbohydrates that is below the glucose tolerance of that patient. This, of course, varies with each individual diabetic, but after a carbohydrate tolerance has been established, it is well to keep below that level, for by so doing, the pancreas is more apt to recuperate and return to a higher point of efficiency. In other words an over-worked engine is more apt to break under the strain than one which is not held at its full capacity at all times.

*Presented in symposium before the Annual Meeting of the Minnesota State Medical Association, St. Paul, October, 1923.

The fourth principle is the result of Woodyatt's opposition to Allen's idea that marked restriction of fats was necessary to keep a diabetic patient away from acidosis and coma. Woodyatt felt that fats could be used as long as a definite molecular ratio was kept between the fatty acid and glucose. This idea was later proven clinically by Newburgh and Marsh and also by Shaffer in his experimental work. Shaffer found that it was necessary to have one molecule of glucose present in order to burn two molecules of fatty acid and thereby helped to develop an old statement of Joslin's that "fat burned better in the flame of carbohydrates." From this work has developed the principle of balancing the ketogenic (fatty acid) and antiketogenic (glucose) molecules in the diet. Usually one and a half to one relationship as suggested by Woodyatt is the best basis of safety.

Many charts have been devised as a short cut using the above principles in our dietary routine. They are all based in some way on this work, but it is worth while to review the formulae used in computing the proper balance of carbohydrates, protein and fat. In the end all food of a diet except a small fraction of the protein is broken down into two elements, namely, glucose and higher fatty acid. We know that

100 grams of carbohydrates give 100 grams of glucose and no fatty acid;

100 grams of protein give 58 grams of glucose and 46 grams (?) of fatty acid;

100 grams of fat give 10 grams of glucose and 90 grams of fatty acid, if burned in the body.

Therefore in the diet

Glucose=100 per cent carbohydrates plus 58 per cent protein plus 10 per cent fat;

Fatty acid=0 per cent carbohydrates plus 46 per cent protein plus 90 per cent fat.

With these formulae and keeping in mind the ratio of fatty acid to glucose, which will give the proper combustion, we can follow the principles mentioned above. It is necessary to remember that diabetic patients are better on a restricted diet than a higher caloric intake, and to add to this the fact that the metabolic rate can be controlled at a lower level if only two-thirds of a gram of protein is used for each kilogram body weight.

Wilder and Boothby have printed a very good chart for this work, and there have been a few developed by other men. These can be used very easily by the clinician, but he should never forget

the basis of the work, namely, a lowering of the metabolic rate without loss of body tissue; low protein; low carbohydrates; and a safe ratio between the ketogenic and antiketogenic substances. These diets are generally called "low maintenance diet." Starvation as used by Allen originally is rarely necessary under this regime.

We can better understand the use of insulin in these patients if we keep in mind the principles mentioned above. Insulin in its preparation and standardization is not to be covered in this article. Due to the courtesy of the Toronto investigators and Eli Lilly, we were able to get a supply of iletin, the name given by Lilly to their preparation. Today we are using it in the University Hospital with splendid results. Because of the limited time we will not report the early results and difficulties encountered in this work. The standardization of this material is nearly perfected at this time and the indications and results will be covered in other articles.

Probably the best method of covering the treatment in uncomplicated diabetes is by reporting typical cases.

A female patient (No. 25960 U. H.), height 5 feet 2 inches, aged 59, had had diabetes for a year. The symptoms had been typical, and she had lost 30 pounds in weight. Six months ago the patient became discouraged and since that time had only restricted the carbohydrates moderately. There was a strongly positive diacetic and sugar reaction and on the day of admission to the hospital the laboratory reports showed a blood sugar of .40 per cent and a plasma dioxide combining power of thirty-six mm. of mercury. The basal maintenance diet was 1,170 calories. It was given as 16 grams of carbohydrates, 28 grams of protein and 115 grams of fat. This diet was continued for three days, and the diacetic test on the urine became negative. On the sixth day the patient was still showing 10 grams of sugar in the urine. On the seventh day starvation, as used under the old regime, was given, and the next day the patient was sugar free. Another day of starvation was allowed since the blood sugar still remained .20 per cent. On the following day we gave the former diet. After six days the patient was still sugar free, and the carbohydrates were increased 10 grams a day until the patient received 76 grams of carbohydrates. Glycosuria developed at this point, and therefore the diet was continued for six days showing an average of 10 grams of glucose excretion daily. Because of the inability of the patient to remain on a low diet in comfort, we decided to give 5 units of iletin to care for the excess of glucose excretion. Therefore the glucose tolerance for this instance would be 110 grams, according to Woodyatt's formulae. Taking this amount of glucose and returning to our relationship, which we wish to keep between the fatty acid and glucose, of one and a half to one gram of each, we are allowed 163 grams of fatty acid, and therefore the diet

should be carbohydrates 76 grams, protein 28 grams, and fat 143 grams. We usually allow the patient to leave the hospital on one gram of protein, if possible, and therefore the patient was later given a diet of carbohydrates 76 grams, protein 42 grams, and fat 115 grams, or a total caloric diet of 1,500 calories. Under this routine there was only a trace of sugar in the urine. Later a higher relationship of fatty acid to glucose was thought safe, and the patient was discharged on the following regime: carbohydrates 76 grams, protein 42 grams, and fat 200 grams, or nearly 2,400 calories. She was receiving five units of iletin daily.

The second case (No. 25734 U. H.) illustrates a more severe case in which the acidosis and glycosuria were more obstinate. The patient stated that he had been living on carbohydrates 25 grams, protein 50 grams, and fats 100 grams daily for a month. He stated that he had been excreting between 15 to 20 grams of glucose daily on this diet. For this reason and due to the fact that his blood sugar was .30 per cent and carbon dioxide combining power 25 mm. of mercury, it was thought best to watch his progress for a few days. Since we found that he showed a daily average of 28 grams of glucose excretion, we decided to place him on a basal maintenance diet of 1,700 calories. He was thirty-seven years old, weighed 145 pounds, and was 5 feet 10 inches in height. The distribution of his diet was carbohydrates 24 grams, protein 42 grams, and fat 153 grams. He was allowed to remain on this diet for eight days and was still showing a daily average excretion of 20 grams of glucose. The diacetic acid test was only faintly positive. On the above diet the glucose intake was 64 grams, but there were 20 grams of glucose excreted. Therefore, his tolerance was only 44 grams. As we thought from previous experience that a fast day would be of little value, we gave iletin to compensate for the 20 gram excretion, allowing 10 units of it a day. This was continued for a week and the glucose excretion fell to only 5 grams daily. We thought best at this time to restrict the amount of iletin given, for his blood sugar had fallen to only .06 per cent and we feared a hypoglycemia. Due to the low amount of carbohydrates in the diet, however, it was decided best to increase the carbohydrates rather than decrease the iletin, and accordingly the next day he was given 44 grams of carbohydrates, 42 grams of protein and 153 grams of fat. He now excreted only 5 to 8 grams of carbohydrates daily, and his blood sugar three hours after the iletin injection was .12 per cent. Later his caloric intake was increased, and he was discharged on carbohydrates 65 grams, protein 60 grams, and fats 215 grams, a total of 2,475 calories. He was taking 10 units of iletin a day when he left the hospital. This is an example where a possible hypoglycemia reaction might have occurred if the blood sugar had not been watched, and this also illustrates the principle of recuperative pancreatic power under proper treatment.

The first two cases illustrate the usual treatment and supervision given a mild case and a moderately severe one without marked acidosis. There are various other cases that would show interesting observations but in order to cover the field allotted to this paper, we will next turn to diabetes with severe acidosis or coma.

Case (No., N. W.) is a very good example of what can be done under energetic treatment and constant supervision with iletin therapy without the use of sodium bicarbonate. A man aged 36, height 5 feet 8 inches, weight 145 pounds, had lost weight for the past three years. Six weeks before admission he developed symptoms of diabetes and refused treatment against the advice of his physician. Two days before entrance to the hospital he became very drowsy, and on admission was in deep coma from which he could not be aroused. Involuntary urination and defecations occurred while he was being examined, and physical examination was negative except for marked emaciation, dehydration, acetone odor to breath, respiration of sixteen to the minute, but very deep and labored. Urine showed a large trace of sugar in the catheterized specimen, and the diacetic test was markedly positive. The blood sugar was .53 per cent and the carbon dioxide combining power was 6.9 mm. of mercury. The patient was placed in bed and warmed under blankets with hot water bottles. He was catheterized and later given a soapsuds enema. Stomach lavage recovered very little, and 400 c.c. of orange juice was given by tube. Hypodermoclysis of 1,000 c.c. of normal saline followed and 400 c.c. of 5 per cent glucose was given intravenously. He was first given twenty units of iletin and four hours later twenty more. Two hours later he was given 10 units more and the patient was allowed to rest during the night. On the second day his general condition was about the same. One hundred and thirty grams of glucose was given in various forms during the day, followed with 50 units of iletin in divided doses every four hours. The next day his blood sugar was .43 per cent and the carbon dioxide combining power of his blood had risen to 17.2 mm. of mercury. On the third day the patient was able to take fluid by mouth, and he received 135 grams of carbohydrates, 10 grams of protein, and 10 grams of fat. He was allowed 40 units of iletin. His blood sugar on the fourth day was .40 per cent. The carbon dioxide combining power was 34 mm. of mercury on the fifth day. He was now mentally clear and was allowed 125 grams of carbohydrates, 50 grams of protein, and 15 grams of fat. Gradually the carbohydrate intake was restricted, being replaced by fats until a basal maintenance diet was established. On the twelfth day the carbon dioxide combining power was normal. His recovery was uneventful, and the same treatment as in the preceding cases followed.

This case illustrates the rules to be followed in the treatment of coma. The rules are as follows:

1. Absolute rest in bed under a nurse's supervision.
2. Patient to be kept warm by the use of blankets and hot water bottles.
3. Catheterization of the bladder.
4. Lavage of the stomach and introduction of glucose in the form of orange juice or glucose solution.
5. Cleansing enema of the lower bowel.
6. Administration of fluid through every possible avenue of entrance, namely, hypodermoclysis

of normal saline, and retention enema by bowel. Fluid intake and output should be measured and recorded.

7. Introduction of glucose in some form by mouth, rectum, and intravenous injection.

8. Administration of iletin subcutaneously or at times intravenously in small divided doses every four to six hours. The use of glucose and iletin should be controlled by the laboratory results on the blood and urine.

9. Treatment of cardiac complications, if they arise, by the use of some form of digitalis subcutaneously.

Sodium bicarbonate is still used by some investigators, but we have not followed it at the University Hospital. We have not found it necessary as a rule, and in the end its results are very transitory unless large amounts are used. We must also remember that after using soda our laboratory results are not a true index of the amount of acidosis which may be present.

In closing permit me to review briefly a few general rules. Our work is not finished when the acidosis and glycosuria is under control. It then falls on the physician to train the patient to care for himself after he leaves the hospital. The old routine established by Joslin is now generally used over the country. The patient must be taught to compute diets and to know the amount of carbohydrates, proteins, and fats allowed in the diet, and how to compute the caloric intake. The urine must be tested daily before the iletin injection, using Benedict's qualitative test as a rule. A quantitative test should be made frequently in order to check results. The patient must be taught to take his iletin under sterile precautions. The symptoms of

hypoglycemia must be known and the necessary treatment for this condition by the use of glucose in some form, as orange juice, milk, lump sugar, or candy. The patient must know the diet to be used in case iletin is discontinued for some reason, and the care for infectious complications that may arise under iletin therapy. In the end the results of patients after leaving the hospital are indices of not only his own intelligence but of the physician's persistence and untiring effort to teach the patient all the possible knowledge he has acquired.

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There are men and classes of men that stand above the common herd, the soldier, the sailor, and the shepherd, not infrequently; the artist rarely; rarer still the clergyman; the physician almost as a rule. He is the flower of our civilization; and when that stage of man is done with and remembered only to be marveled at in history, he will be thought to have shared as little as any in the de-

fects of the period and most notably exhibited the virtues of the race. Generosity, he has, such as is possible to those who practice an art, never to those who drive a trade; discretion, tested by a hundred secrets; tact tried in a thousand embarrassments, and what are more important, Herculean cheerfulness and courage.

—ROBERT LOUIS STEVENSON.

INDICATIONS FOR THE USE OF INSULIN*

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It is evident that the program committee had a definite purpose in mind in assigning the subjects for this symposium on insulin: it was to bring before you a practical consideration of the changes it has brought about in a consideration of the pathology back of diabetes and the extensions it has provided in the way of treatment.

The first paper has already given you a clear statement of the modern dietary treatment. The third paper will discuss the gravest danger arising from the improper use of this new and powerful therapeutic agent. The final paper, discussing the emergencies arising in diabetes, will cover the very vital subject of acidosis and diabetic coma.

It will, therefore, be the writer's intention not to trespass upon these fields, but devote some time to an analysis of the classes of individuals ordinarily diagnosed diabetic; to point out particularly those in which insulin is a decisive and vital aid in treatment. Finally, to bring out enough of the scientific interest involved in an understanding of some general principles in physiology and metabolism, as to enable us to understand the great volume of current literature that is now giving us such effective directions and rules for its exhibition.

THE PROPORTION OF DIABETICS NEEDING INSULIN

Seventy-five per cent of diabetics properly diagnosed do not need insulin routinely.

1. Of this group the largest number comprise the atherosclerotic or "aging" group—either senile or presenile—and accordingly, range in age from fifty to seventy years. It must be definitely stated, however, that while this group can, as a rule, be properly safeguarded as far as carbohydrate metabolism is concerned by conservative dietary measures, they may at any time come into condition where insulin is a very great aid. We need only briefly mention here the well known states dependent upon acute infection,¹ furunculosis, necessary surgical operations, persistent dermatitis or vulvitis, and a great many other troublesome disorders vitally interfering with sleep and digestion, not to say peaceful, happy life.

This group clearly borders upon the infectious pancreatitis group, known to be associated with acute and chronic infections of the biliary tract—a very excellent field for surgery. However, after all is accomplished that surgery can do, these patients rarely lose all their glycosuric tendencies and take on the attributes of either the vascular or the obese groups.

It must be fully remembered that as these atherosclerotics continue with their advanced, widely distributed degenerative body processes, they enter gradually upon conditions of decline closely simulating a general acidosis. It will be found that it is too much to expect that the late administration of insulin to these patients will restore much bodily function where the process is already greatly advanced. In other words, it is likely that the degenerative process, as far as the Islands of Langerhans are concerned, is as patchy and incomplete as applied to the pancreas, as it is to other organs, such, for example, as the kidney.

It should be remarked that no single patient in this very large group of so-called diabetics should go without the most careful understanding incident upon a thoroughgoing examination of the *objective evidences* substantiating a diagnosis of arteriosclerosis, or, to use a better word, atherosclerosis. This includes particularly a careful study of the eye-grounds and the peripheral arteries; of course, an estimate of the myocardium and the probable coronary circulation; attention to obscure signs of intermittent claudication; finally, a due consideration of the changes incident to widespread sclerosis of the brain and cord.

2. The next important subdivision in this group concerns the so-called "obese" diabetics. It is quite certain here that insulin need only be considered for intercurrent conditions or complications. We should also recall that the obese patient has available a very considerable depot of fat, and in determining anti-ketogenic and ketogenic relationships the amount of fat fed should be correspondingly less.

3. The variety of indefinite endocrine disturbances, the result of probable polyglandular perversion, in which the pituitary and thyroid glands stand out conspicuously. Pregnancy introduces a complicating and stimulating factor at times important. For the purposes of this discussion little need be said, because the group is small and the classical picture of diabetes is rarely even approached.

*Read in symposium before the Annual Meeting of the Minnesota State Medical Association, St. Paul, October, 1923.

4. We may take the same attitude toward the glycosurias incident to cranial injury or cerebral neoplasms, except that the relationship between brain injury and the development of the true picture of diabetes is still much discussed and probably does exist.

5. Finally, renal diabetes must be considered only to point out that it has no connection with pancreatic failure, and therefore does not concern the use of insulin. A word of caution is necessary, however, not to overdiagnose this interesting but rare condition. Unless the fullest of safeguards are put about the diagnosis it is apt to include other conditions, notably the early atherosclerotic type.

THE SEVERER GRADES OF DIABETES

The remaining 25 per cent of severer grades of diabetes have much to hope for from the use of insulin. This concerns the very vital juvenile and early diabetics. It includes any diabetic who is to be operated upon; naturally, any diabetic with an infectious or acidotic complication, and possibly also any diabetic headed toward severe trophic disorder like gangrene or cataract.

First of all, the investigations and studies incident to the isolation of insulin and a development of its properties, establish convincingly the contention, long conjectured, that the disease is due to a failure of function on the part of the Islands of Langerhans.

It can be safely predicted that its use will become more and more extended to those chronic cases, even of milder severity, because the simple fact back of its use, which justifies the greatest hope from its use, lies in the principle of resting overworked, underproducing Langerhans Islands. That was the basis back of our previous treatment for diabetes that was any good. Insulin treatment has not displaced dietary regime; it has simply elevated the dietary treatment to a fixed position, and without it *insulin cannot be used*.

HISTORICAL CONSIDERATIONS

Previous to Allen's regime of food restriction, the old treatment of diabetes, which would simply direct the patient to cut down on the intake of sugars and starches, was absolutely hopeless:

1. It did not consider at all the basal maintenance needs of the body nor much concern itself with the body activities of the patient.

2. Protein was fed indiscriminately, without any particular idea as to the basal needs (two-thirds gram for each kilogram of body weight). Not

only was the intake of protein apt to greatly tax the body, but it did not consider the fact that 58 per cent of this foodstuff was available to the patient in the form of glucose.

3. In addition, it was not understood or considered that 10 per cent of the fat (glycerol-Wood-yatt) was likewise available as carbohydrate.

Then, with the thoroughly scientific regime as outlined by Joslyn, Allen and others, the diabetic was made quite safe, and the overtaxed pancreas, like the overworked myocardium, under the influence of rest attained a certain degree of better function. But, for many individuals, this meant a life of such restriction of energy output as to make it quite impossible for them to carry on or make a living. With fat yielding 9 calories per gram on combustion, to 4 each for either protein or carbohydrate, it was inevitable to attempt the highest possible utilization of fat in providing not only a maintenance body diet but something to work on. Hence, the so-called "high fat" diet as outlined by Newburgh, Marsh, Woodyatt, Wilder and others. The very evident advantage of the fat if excessive ketogenic factors could be obviated was self-evident. Nevertheless, this apparent difference of opinion among accepted authorities was not a little disconcerting to the ordinary practitioner handling diabetics. Therefore, one of the very greatest benefits accruing to the profession from the discovery of insulin is the clarifying of the atmosphere and making certain things quite clear. For purposes of brevity some of these are being summarized:

1. Diabetes is not a disease due to the inability of the tissues to utilize any kind of carbohydrate.*

2. It is due to a failure of the Islands of Langerhans to discharge into the circulation a hormone, and therefore the pathological disorder back of diabetes does reside in that portion of the pancreas.

3. This hormone does not primarily incite or stimulate directly the burning of carbohydrates (Boothby and Wilder²), but simply changes the structural formula of glucose in such a manner as to activate it and make it available as a source of combustion or glycogenic storage. One definite proof of this is seen in the fact that it does elevate the respiratory quotient.

A unit of iletin as now manufactured by Lilly

*It is astounding to note how rapidly the literature has swung about from that long held hypothesis.

& Co. may be depended upon to prepare for utilization 1.5 to 2.5 grams of carbohydrate.

4. Fat is always burned in the body "in the flame produced by the burning of carbohydrates." This was clearly known before but never in the dynamic or dramatic definiteness that the use of insulin has established.

5. Where the proper relationship between the carbohydrate and the fat is not properly maintained the body carburetor cannot function, and the accumulated soot of improper consumption is made up of the ketone bodies—acetone, diacetic acid and beta oxybutyric acid—and an acidosis results.

6. The Toronto committee³ advised that it is fair to assume that carbohydrates, properly available, will burn fat in the proportion of one to two. Recently, Ladd and Palmer⁴ claim that an entirely safe ketogenic relationship ensues both in the normal as well as the diabetic individual where the ratio of one to four is maintained.

7. If one understands reasonably well the ordinary dietetic treatment of diabetes, an understanding of these simple principles will render the use of insulin comparatively easy. It will require no more accuracy than that needed in the digitalization of a case of chronic myocarditis with auricular fibrillation. The present situation is an excellent time to develop a plea for accuracy and a little general mental concentration.

Von Mering and Minkowski, over thirty years ago, gave the lead that unerringly developed this triumphal product of research genius.

We are witnessing this triumph in the isolation of insulin, the result of care and accuracy in the use of *an old method* of alcoholic extraction of the active principle from the glands of internal secretion. We should be willing to meet this by an accuracy of our own. Certainly no hesitating public, as met Jenner with his eliminator of smallpox, awaits us; on the contrary, hordes bare the arm for almost any kind of injection (Loeffler's intravenous included).

The dosages of antitoxins, serums and vaccines, have been as grotesquely indefinite as the dosage of whisky. Likewise, endocrine tablets and their multi-varied combinations have been about as direct as if, in their use, a hunter threw his ammunition at his quarry—he might better remain in his caveman realm and hurl a sharp stone instead.

No method of the oral administration of insulin has so far been accepted, yet drug houses send their

salesmen back and forth across the entire country lustily discussing how their particular company, by superior judgment and skill, is able to extract the pancreatic hormone and combine it variously, stressing their arguments for its supposed benefit by the flimsiest of clinical reports. Why, gentlemen, do we tolerate this sort of thing at the very time when we have before us the dignified attitude of Banting and Best and their co-workers, together with the very ethical and helpful attitude of the American manufacturer of iletin?

It is a most wholesome mental pursuit for all of us to review the present literature on insulin. It helps to remove the cobwebs and dust from our understanding of certain simple physiological processes, and gives us a great variety of surprises and pleasures secondarily.

Just to illustrate one of the many: Crile has long pounded in the idea that a proper glycogenic storage in the liver is a great safeguard for the operative patient. He has elevated the much despised and contumeliously regarded organ to that position where it stands as the great stabilizer even of the nervous system. Now, observe in the literature on the use of insulin just prior to operation, that it is advised that the customary intake of glucose is probably not necessary because the shock incident to the operation will let free sufficient adrenalin to mobilize plenty of the glycogen in the liver to balance combustion properly! This is only a passing instance, of which there are many.

Finally, every patient using insulin in more than temporary periods must come to know the rationale of its use. Hence, the wonderful lead of Joslyn must be followed up. The physician must teach, and if he is to teach he must know. Classes in association with hospitals or clinics are unquestionably most potent factors, and the grouping of these patients has many advantages. Ultimately, a lot of diabetes must be prevented by instruction that will induce those with congenitally weak pancreases to watch their step, dietetically speaking.

THE GENERAL ADOPTION OF THE METHOD OF INSULIN TREATMENT

The new departure in the matter of giving to the profession the results of this most valuable piece of research has been given much and very favorable consideration. Thanks to the liberal attitude of the American manufacturer, the product known as iletin has been available to research and teaching institutions just as soon as its supply was sufficient.

In fact, few medical centers have been without it where its use in emergencies demanded it. As a result, convincing and authoritative reports and discussions have come into the literature freely, and are now available, and in this productive field, we in Minnesota may take full pride in the fine series of articles that have come from the metabolism wards and laboratories of the Mayo Clinic.

It is obviously impossible for you to listen to a discussion such as this and carry away much more than an incentive to ferret out the details. I urge those of you who are interested to go directly to the numerous splendid articles now in the journals⁵ or in pamphlet form. Read as an introduction the special article by the Toronto committee³ in the *Journal of the American Medical Association*. Read the Mayo Clinic⁶ number of the *Medical Clinics of North America* for July, 1923. Study carefully Wilder's nomographic chart, especially as modified by his associate Adams. The September journal of this association—MINNESOTA MEDICINE—in an article by Wilder,⁷ again puts in very usable form an immediate diet for those threatened with diabetic acidosis.

Gentlemen, insulin is ready for us; let us make ourselves ready to properly dispense it. The future will probably greatly expand the field for its usage. It is not impossible that it may include in some

measure metabolic complications such as non-diabetic acidosis. Our private and hospital laboratories should, of course, be equipped to handle the ordinary routine laboratory tests necessary to complement the work of the clinician in these various fields as they are developed.

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"PEACE ON EARTH, GOOD WILL TOWARD MEN"

As this is the celebration of the birth of The Great Physician, it behooves each and every one of us to examine the trend of our own life and square it up with the life of him who, through the whole course of his service to mankind, never once faltered in his duty to humanity, and finally gave his life blood that we might see more clearly what true service means.

In our mad rush for financial independence, do we not often forget the nobility of our profession, and have we not ourselves been partly responsible for the lack of respect and the lack of confidence which the public in general has shown toward the medical profession during the past fifteen years? Medicine is one of the oldest of the professions, and the medical man should be the leader in every community to which he administers the healing art. Let us rise up, then, in our might and be the true leaders in our respective communities on all questions pertaining to health and sanitation. Why should laymen usurp our prerogative of leadership in the one subject in which we are experts?

A labor union is all right in its place and has done a great work in bettering the workmen's condition, but, can any one imagine the staff of Cook County Hospital or the Dunning Institution going out on strike for any reason

whatsoever, and allowing the poor human beings under their professional care to suffer and die because of a few paltry dollars? Never! Or can you imagine our city or state health officers leaving their posts of duty while an epidemic was raging? It never has been heard of and never will. It is, therefore, one of the distinguishing differences between our profession and a so-called union.

We may play with politics for a time and accomplish some of the things which are necessary for our economic welfare if we happen to be on the winning side, but the past ten or twelve years have proved to the medical profession of Cook County, at least, that politicians will promise anything before election and shut the door in our faces thereafter.

No, sir, we can never become a labor union, or a political party, nor can we become affiliated with them, in fact, and the sooner the medical profession realize this, the sooner they will become the real leaders in all questions pertaining to health and sanitation, and the sooner we will be given the honor and respect that was once ours without question.

As the New Year opens, let us be governed by the example of the Great Teacher and Physician when he said:

"Inasmuch as ye have done it unto one of the least of these, ye have done it unto me."—*Bulletin of Chicago Medical Society*.

HYPOGLYCEMIA*

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The observation that a condition of hypoglycemia can be produced in a normal animal (rabbit) by the subcutaneous administration of an extract of pancreas containing the active principle was first made by the writer in December, 1921, shortly after he became a co-worker of Banting, Best and MacLeod. It was due more to this observation than to any other single factor that the writer was enabled in a few weeks' time to isolate the active principle of the pancreas in a sufficiently pure and stable form to allow of continuous administration of the same to the human subject. The rabbit test also served as a means of assay of the first insulin used in the treatment of human diabetic subjects. The unit which was first used in this connection was the amount of extract which would produce a 50 per cent decrease in the blood sugar level of a 2 kilogram rabbit. It was later discovered that normal rabbits manifest typical symptoms when the blood sugar has fallen to a level of approximately 0.045 per cent. It was also noted at the same time that animals having such a severe insulin reaction could be recovered within a few minutes by the use of glucose. Adrenalin was also shown to have a beneficial effect on this condition. The physiological unit which was later adopted was the amount of insulin which would produce convulsions in a 2 kilogram rabbit. The clinical unit now in use is approximately one-third of the original physiological unit.

It is very significant that the observations of the effect of insulin on normal rabbits above mentioned which contributed very largely to the successful development of insulin are also essential facts which must be fully appreciated by all who are to use the pancreatic hormone in clinical practice.

There would seem to be no essential difference between the state of profound hypoglycemia which can be produced in a normal animal by adequate insulin dosage and the similar state which is sometimes produced in a diabetic subject by insulin overdosage.

The primary effect of the administration of insulin to either a normal or a diabetic subject is to cause a fall in the level of blood sugar. What the exact nature of this primary effect may be is not yet fully understood. It has been well established that glycogen synthesis takes place in the liver of a diabetic dog under the influence of insulin. It may be possible therefore that sugar storage in the form of glycogen may account entirely for the decrease in blood sugar level of both normal and diabetic animals which have received insulin.

It is a noteworthy fact, however, that the liver of a normal rabbit which has manifested a hypoglycemic reaction following insulin administration may on occasion be found to be practically free of glycogen. Mann¹ has also very definitely shown that the liver is non-essential to the production of the hypoglycemic reaction by insulin. There are factors, therefore, other than glycogenesis which may account for the disappearance of sugar from the blood of insulinated individuals. Best and Hepburn early demonstrated that the respiratory quotient rose in diabetic subjects within a few hours after the injection of insulin, and shortly before this the writer had shown that ketosis could be abolished in depancreated dogs by the use of the pancreatic hormone. These two observations indicate that glucose burns freely in the tissues of insulinated diabetic individuals. It is herein that the chief value of insulin lies. The tissues of the insulinated diabetic subject are enabled to utilize glucose and thereby are capable of burning fatty acids to the normal end products CO_2 and H_2O without the accumulation of ketone bodies. Normal metabolism therefore ensues and acidosis is abolished.

When as a result of insulin overdosage, the blood sugar has fallen to a very low level, an unphysiological state is produced and a typical train of symptoms ensues. Almost immediate recovery from the hypoglycemic symptoms can be effected if the level of blood sugar is suddenly raised as by the administration of glucose. It is of interest in this connection to note that there is a certain amount of evidence that a spontaneous effort is made to raise the blood sugar level in the hypoglycemic state through the discharge of adrenalin from the supra-renal glands.² On occasion we have noted a pilo-motor effect in rabbits in a condition of hypoglycemia. If the dose of insulin administered is just sufficient to produce convulsions in an

*Presented in symposium at the Annual Meeting of the Minnesota State Medical Society, St. Paul, October 11, 1923.

experimental animal, spontaneous recovery may occur. The end result of insulin overdosage is, as a rule, death unless recovery is effected through the administration of glucose. If a condition of profound hypoglycemia is maintained for some hours before glucose is administered, the effect of the latter may not be so striking. Complete recovery may not occur for some time. In other words, the maintenance for any length of time of this unphysiological state of profound hypoglycemia may result in the production of changes which are to a degree irreversible. There is a probable analogy here between the coma of long duration in the diabetic and the coma of profound hypoglycemia.

Theoretically, recuperation of the insular tissue of a diabetic and thereby increase in native tolerance for carbohydrate is most likely to occur if the blood sugar be kept within or even slightly under normal limits by adequate insulin therapy and a proper dietetic regime. In this, the most scientific type of insulin therapy, there is always the constant danger of the hypoglycemic reaction. Practically, therefore, if such a reaction be met with it should be counteracted at once.

The nearest parallel to the hypoglycemic reaction observed following insulin administration is the condition of hypoglycemia described by Mann³ as observed by him on deliverized dogs. Mann has shown that following complete removal of the liver the level of blood sugar falls gradually and progressively, that typical symptoms occur when a certain low level is reached and that temporary recovery is effected by glucose administration. Mann found, however, that these deliverized animals though benefited for some hours by glucose administration ultimately died in spite of the sugar injections. These results demonstrate that the liver plays a very essential part in the regulation of blood sugar level.

The mechanism for the regulation of blood sugar concentration in the normal animal is in all probability a very complex affair. Such factors as the normal functioning of the pituitary, pancreatic and suprarenal glands and liver together with the actual metabolic needs and the concentration of blood sugar itself must all form integral parts of this regulatory mechanism. When in experimental work, therefore, a marked deviation from normal blood sugar standards is noted, it is not always a simple task to determine just what part of the nor-

mal mechanism has been thrown out of gear, so to speak.

As soon as it had been established that the functions of sugar storage and sugar combustion in the animal were dependent upon insulin activity, the writer felt that in all probability further research would disclose the existence of an insulin-like substance in the vegetable kingdom, since plants are sugar burners. It was later shown⁴ that extracts made from a variety of plant sources may produce hypoglycemia when injected into normal rabbits, or a very definite lowering of the blood sugar of depancreatized dogs. It was noted, however, that whereas the administration of insulin is followed by a prompt fall in blood sugar, the fall in blood sugar which occurred following the administration of plant extracts did not take place till some hours or, in certain instances, some days following the administration of the extract. The effect of injected plant extracts was therefore quite distinct from the effect of insulin.

It was later observed⁵ when a condition of profound hypoglycemia had developed in a normal rabbit following the administration of a plant extract, that the injection of a small amount of blood of such an animal into another normal rabbit produced in the latter animal a condition of hypoglycemia. The hypoglycemic reaction developed in the second animal usually within a day. It was also found that such animals could be temporarily recovered from the hypoglycemic state by the injection of glucose. The condition of profound hypoglycemia continued to recur even after glucose administration and the animals would as a general rule ultimately die. The blood of such animals would, however, produce similar effects when injected into other normal animals. Blood passage of this effect could be carried on successfully to an indefinite extent. When this phenomenon was first observed it was thought that an organism might be the underlying cause. This possibility was excluded, however, when it was shown that such a potent blood was still active after autoclaving.⁶

It has since been shown that a similar result can be obtained with the blood of insulinated rabbits. It is necessary to give a large overdose of insulin and to keep the injected animal in a condition of profound hypoglycemia for many hours. The blood of the insulinated rabbit has then produced

hypoglycemia when injected into other normal rabbits.

Spontaneous hypoglycemia may be noted on occasion in certain individuals in a rabbit colony. The liver in all such cases observed by us has been found to be full of cysts, and coccidia ova have been demonstrated on microscopic examination. The blood of such an animal will likewise produce hypoglycemia when injected into other normal rabbits.

Recently we have been able to show that prolonged starvation of rabbits results in the manifestation of profound hypoglycemia just prior to death. The blood of these animals will also produce hypoglycemia if injected into other normal rabbits.

The subcutaneous injection of certain guanidine compounds may also result in the manifestation of profound hypoglycemia. The blood of guanidized animals under these circumstances has also been observed to produce hypoglycemia when injected into normal rabbits.

I have recently obtained through the kindness of Dr. Mann, of the Mayo Clinic, a sample of blood from one of his deliverized dogs. The injection of this blood into rabbits was followed by the manifestation of hypoglycemia.

The production of the hypoglycemic state by any of the methods above described stands in sharp contrast to the typical insulin reaction. The in-

sulin reaction is manifested within a few hours of the time of the injection whereas the hypoglycemic reaction otherwise produced develops much more slowly. The phenomenon of "delayed action" can also be seen after the administration of pancreatic extracts which have been kept slightly alkaline throughout their preparation.

As hypoglycemia can be produced in such a variety of ways, one is led to ask this question: "Is there some fundamental similarity in the mode of activity of these various agents, insulin included, or is it merely chance parallelism which we are dealing with?"

It is conceivable that liver injury might explain all of these results. Further research only can settle the issue, meanwhile I present the results for what they are worth.

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FROM A COMMITTEE REPORT OF SEVENTY-FIVE YEARS AGO

It is in vain to attempt the enforcement of any direct legal restrictions upon the people in regard to medicine; if they choose quacks and quackery, no law which would forbid such choice can stand in this country.

That there should be some laws in relation to the medical profession there is no question. But the ideas which are commonly entertained in regard to the scope and object of these laws are somewhat indefinite even among medical men. In the opinion of the committee, the object of these laws should be simply this—to give protection to those measures which are calculated to secure to the community a well-educated body of physicians. Everything inconsistent with the attainment of this object should be discarded. No class of physicians, professedly and exclusively devoted to any system of opinions and practice, should as such receive such protection. The medical profession should be a single body of men without any prescribed set of opinions. And the ground of admission to their ranks should have no reference to opinions; but there should be the greatest latitude

in this respect. Character and education should furnish the only basis of membership.

We are persuaded that, if the profession as a whole should take this view of the subject, we should stand in a much better position before the public than we now do. We should then be able to propose to the community the question, clean and stripped of all incidental and embarrassing considerations, whether they would sustain an educated or an uneducated profession. We should stand simply and clearly upon our merits in this respect, and should command the respect and confidence of the great majority of the community. But whenever other grounds are taken and opinions are made in any degree the basis of admission or expulsion, we lose this respect and confidence, for we enter into competition with opinionists of every grade, and upon their own level. At this moment, the strife between the regular profession and other self-constituted medical bodies is regarded by even sensible men in the community as being for the most part a war of opinions. And some ground is given them for this view of the subject by occasional acts by individuals, or even by some of our associations.—A. M. A. Bulletin, Nov., 1923.

THE TREATMENT OF THE EMERGENCIES OF DIABETES*

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There is little reason to believe that insulin will materially affect the underlying metabolic fault in diabetes. In fact, it is possible, as certain observers maintain, that the better nutrition which the use of insulin permits, may hasten the progress of the underlying disease more than formerly under régimes of undernutrition. Instances of improvement in tolerance following the institution of insulin treatment in the Clinic have been observed and commented on, but the patients either had the chronic type of diabetes, or were in an early stage of the acute and inherently progressive disease. The severest cases have not shown such improvement; a few of our patients are now requiring larger doses than they did a year ago, and one of the children seems to be reaching a stage of complete dependence on insulin. It is highly probable, therefore, that the patients with the acute type of diabetes will, in a few years, lose all their native tolerance and become completely diabetic. I wish to emphasize this probability, first, because of the necessity of envisaging the prospect of having gradually to increase the present daily dose of insulin, and second, because of the importance of insuring an uninterrupted supply of insulin in cases of complete diabetes. When patients have been kept alive by insulin long enough for their native tolerance to evaporate completely, their diabetes will be complete or total, such as has never been encountered in the past, and if, therefore, they are deprived of their quotidian injections, for ever so short a time, acidosis will develop with remarkable rapidity, and neither fasting nor careful dieting will avail to protect them. Their metabolism will consist exclusively of the ketogenic acids, regardless of their diet. No glucose will be available, and 100 or more grams of aceto-acetic acid will accumulate daily. A hypothetical example may throw light on the amount of insulin which will ultimately be necessary to keep such patients alive.

From available data on the energy exchange of

normal resting individuals, it may be calculated that a man, thirty years of age, 5 feet 10 inches in height, and weighing 150 pounds, will generate approximately 1,700 calories a day. With no energy derivable from glucose, this heat must all be supplied by ketogenic acids, and the amount of these in terms of fat would total about 180 gm. According to prevailing views, such an amount of fatty acid would necessitate at least 56 gm. of oxidizing glucose, if acidosis is to be avoided. It might be estimated, therefore, assuming that a unit of insulin will accomplish the metabolism of 1.5 gm. of glucose, that 37 units of insulin would be necessary daily. The unit of insulin, however, may not have such potency under these conditions. The method of assaying insulin clinically, which gave the average figure stated, was proposed chiefly as a means of comparing the strength of one lot of insulin with another, and it is obvious that the figure can be obtained only under the condition imposed for the clinical assay.¹ Infections and other complications, as well as nervous influences and probably severe acidosis itself, may be expected to affect it unfavorably, and, in the assay proposed, only those patients were selected for the test who were "free from infections or other complications and comparatively calm in temperament."

It is not unlikely that the hypothetical patient under discussion would require at least 1 unit of insulin for each necessary gram of sugar, and this would make his minimal daily insulin requirement 56 units. Furthermore, these are figures for a person at rest. If the hypothetical patient is to carry on a gainful occupation, and is to be given sufficient food to supply the energy for such work, the requirement will be still greater. Thus, we have found it desirable, in order to plan satisfactory large diets that are palatable, to establish a tolerance for at least 100 gm. of glucose, which might necessitate the injection of 100 units daily.*

As a matter of fact, one of our patients, D. D. (Case A386254), a child now three years old, has recently required 60 units of insulin daily with a food allowance of carbohydrate 50, protein 50, fat 100. As was reported previously, this same child developed severe insulin shock a year ago with only 12 units. There may be undiscovered infection complicating the case at present, but a

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*All references to insulin dosage in this paper are based on the original "Iletin" unit of the Eli Lilly Company, namely their "H-20" material.

great decline in tolerance seems to have occurred during the year. The insulin dosage has been raised gradually. With 60 units of insulin a day the child is apparently normal. With a smaller dose he develops acidosis at once.

To most of the patients treated thus far, it has been possible to give insulin in a single dose daily, or in two doses; this is naturally preferable to more frequent injections. However, it is probable that, as the patient advances toward a state of complete diabetes, it will be necessary to increase the frequency of insulin injections in order to shorten the interval between doses. The child, D. D., is receiving 60 units in three doses, 25 units before breakfast, 20 at 2 P. M., and 15 at 8 P. M. We have now used insulin in the treatment of 370 patients, of whom 181 are continuing its use in their homes. These patients have received a fair training in dietetics, and have been advised with regard to the necessary dose of insulin. They are weighing their diets and taking regularly from 15 to 45 or more units of insulin daily. The greater number of these patients are strong, and able to engage in their normal work. Disaster, however, has overtaken a few of them, and I anticipate that as the others more closely approach the state of total diabetes, disaster will become more common. A few patients have failed to receive their allotments of insulin. For the most part, they have been supplied through their home physician, the material being mailed to the physician by the manufacturers. Occasional slips have occurred through loss or damage of the material in the mail. All of the patients have been carefully instructed, both while they were in the hospital and subsequently by correspondence, to insure themselves against such accidents by always keeping on hand at least one extra month's supply of insulin. In spite of such warnings, patients occasionally find themselves without insulin. In one case death in diabetic coma resulted within thirty-six hours after the injections were discontinued, and at least three patients have returned for treatment just in time to avoid a similar catastrophe.

The danger to the patient with complete or nearly complete diabetes from missing an injection imposes the enormous responsibility on everyone concerned with the use of insulin, of seeing that patients receive their injections of an insulin of satisfactory potency regularly and without fail. I

feel sure that the members of the Eli Lilly Company fully appreciate their responsibility, and are making every effort to maintain the product at a standard strength. I regret that I have less confidence in the patient's physician and in the patient. Certain patients will forget about their reserve of insulin, others will be persuaded to try some of the many other pancreatic preparations on the market, with results that must inevitably prove tragic.

Acidosis and coma, if the patient is conscientious and well-trained, are almost always invoked by some complicating infection or infectious disease. Anesthetics and surgical procedures do, it is true, precipitate acidosis and confront us with a similar problem. A careless, ignorant, or willful patient may, through dietary indiscretion, promptly develop diabetic coma, but the fate of such a patient is less disastrous than that of the conscientious and intelligent patient who is suddenly stricken with pneumonia, typhoid fever or measles. It is to the management of such infectious complications that I wish especially to call attention.

THE MANAGEMENT OF INFECTIOUS COMPLICATIONS

The influence of the infections on the metabolism of the diabetic patient is a subject deserving further study. An immediate break in tolerance is produced which usually results promptly in acidosis, and unless suitable measures are instituted to combat the accumulation of acetone bodies, the outcome is almost certain to be coma and death.

Whatever the mechanism involved, the facts are that a patient with partial diabetes may be suddenly converted by infectious processes into one with total diabetes, and during the continuance of the infection, doses of insulin as large as, or larger than those computed for patients with total diabetes may become necessary immediately and continue necessary until the complicating infection subsides. It has been difficult sufficiently to impress patients and physicians with the necessity for heroic use of insulin in such emergencies. So much has been written concerning the danger of the insulin reaction, or insulin shock, as we prefer to call it, and of the necessity of balancing the insulin dose with the food, that a certain timidity has been engendered. For example, a patient who is doing well on a certain dose of insulin and a definite, properly calculated and weighed diet develops an infectious complication. His appetite fails, and he

or his physician thinks that, since he cannot eat, the dose of insulin should be reduced. Metabolism, however, does not stop by reducing the diet; it may, in fact, be increased by the fever, and the insulin, even in the absence of food, may have a much feebler action than usual, as the result of the deadening effect on it of bacterial toxins. The consequence of reducing insulin dosage under such circumstances is the rapid development of acidosis, and the precipitation of coma. One child was rushed back to the Clinic in coma as the result of such a mistake.

It cannot be too strongly emphasized that the advent of an infection always demands not less, but more insulin, and that large doses of from 15 to 25 units, may be needed every six hours, so long as the infection continues. As in the case of uncomplicated but total diabetes, the interval between doses must be brief, and the daily dose must be divided and administered in three or four equally spaced injections.

It is important to use carbohydrate fairly liberally. Fruit juices are well tolerated, and contain sugar in an especially available form, in large part as fructose. It is considered that orange juice contains ten parts of carbohydrate. We make it a rule to administer by mouth 100 gm. of orange juice with every 20 units of insulin injected, and have found that in toxic cases this amount of carbohydrate will satisfactorily buffer the insulin and at the same time supply the sugar necessary to counteract ketosis. Besides the carbohydrate of the orange juice, such soft foods as the patient will accept, especially milk, cream and eggs, are given. However, the total carbohydrate ingestion should not exceed 100 gm. daily. It does not seem necessary or desirable completely to avoid glycosuria at such times; the control of acidosis is primary. Every effort is made to prevent the accumulation of acetone bodies.

Despite fairly large doses of insulin and adequate carbohydrate, an exacerbation of the infectious process may at any time provoke sudden acidosis. It is, of course, extremely helpful to have at hand the laboratory facilities for examining the blood for the carbon dioxide capacity of the plasma, but in the absence of such facilities, the respiration of the patient is a reliable indication of the state of the alkali reserves. Air hunger, the long deep "Kussmaul" type of respiration, is a sure sign that

the stores of alkali are depleted, and such breathing, if accompanied by a strong acetone smell and other definite clinical evidence of acidosis, is an indication for giving soda. The disrepute into which sodium bicarbonate has fallen is undeserved. An intravenous injection of 500 c.c. of a 6 per cent sodium bicarbonate solution will immediately affect a critical acidosis, and to neglect its use in such an emergency is unjustified. Insulin and carbohydrate may accomplish the same result as soda, but the delay entailed may tip the balance unfavorably. Severe diabetic acidosis is dangerous, and should be controlled as rapidly as possible.

When the infection subsides, the patient's native tolerance, which has been temporarily suppressed, returns in part at least, and the necessity for large insulin doses passes. It is then important to reduce these doses in order to avoid overaction and insulin shock. It is usually possible to return gradually to the diet and dosage which were effective before the onset of the complication.

It has been necessary to combat a number of very severe infections in the large number of diabetic patients observed in our wards during the year, and by carrying out the general principles discussed, the mortality has been kept very low.

SUMMARY

Use enough insulin to control acidosis. This may require from 60 to 100 units daily, and should be given in equally divided doses at six-hour intervals.

Administer by mouth 100 gm. orange juice with every 20 units of insulin injected.

Watch the breath for the odor of acetone; examine every voiding of urine for diacetic acid. If possible, and if doubt exists, obtain the carbon-dioxide capacity of the plasma. If signs of severe acidosis develop, the Kussmaul type of respiration or a carbon-dioxide plasma capacity below 20 volumes per cent, use sodium bicarbonate as a 6 per cent solution intravenously, giving 500 c.c., and repeating this injection if necessary.

Reduce the dose of insulin and readjust the diet when the complication has passed.

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THE EAR IN GENERAL MEDICAL DIAGNOSIS*

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In the practice of medicine at the present time very complex problems in diagnosis are dealt with. Such a state of affairs has naturally led physicians to a more intensive study of conditions affecting certain organs, or groups of organs. The fact is sometimes lost sight of that symptoms referable to certain regions may be due to disease conditions in a distant part, or at least a part quite removed from the site of the original complaint. Recognition of this phenomenon is the function of the diagnostician. The otologist is expected by the state boards of medical examiners to be able satisfactorily to examine the chest, abdomen, and central nervous system, to interpret laboratory findings, and so forth; in other words, to have at least a good general understanding of the general physiology of the body. The tendency is quite prevalent, among general diagnosticians, to relegate to the otologist all patients with symptoms referable to the mechanism of the ear, although in the successful management of many such cases the services of the internist are indispensable. A better general understanding of the symptoms related to the ear referable to certain deranged conditions of other parts of the body would be of great advantage to many internists. Examination of the eye is resorted to for confirmatory evidence by many internists in certain types of cases. It must be borne in mind that each organ forms an integral part of the complex whole.

Physicians, on final analysis, are more or less familiar with many of the causative factors of symptoms related to the ear, but forget that they know about them. I shall mention here some of the more common general conditions which may affect the mechanism of the ear for the sole purpose of recalling them to memory. The symptoms which may attract the patient's attention to this mechanism may be classified in three main groups: tinnitus aurium, deafness, and pain. Vertigo and its sequelae, nausea and vomiting, are not generally regarded as symptoms due to disorders of the ear.

TINNITUS AURIUM

The actual causal factor of tinnitus, even the histologic and pathologic factor, is very difficult to determine. Tinnitus may be caused by local conditions within the mechanism of the ear, but very often it is caused by quite remote conditions. When one recalls that the arteries supplying the ear are end arteries as demonstrated by Shambaugh, and that the internal carotid and internal jugular vein are separated by only a thin plate of bone, one can easily understand how changes in the nervous mechanism controlling the caliber of the blood vessels might readily have a very definite effect. It may be said in general, I believe, that tinnitus is caused by some disturbance of the local circulation. It is also true that there is a more or less constant tinnitus in normal persons, but this is disregarded. Anyone, when tired, may sit quietly, and by merely listening will notice tinnitus.

One would expect that, in cardiovascular disease, tinnitus might be a common symptom, and this is the clinical experience of most otologists. Obviously, the treatment is not local. Occasionally the patient is terribly distressed, and not infrequently has a suicidal tendency. The patient's particular fear is that the tinnitus may be a precursor of oncoming deafness, but this does not necessarily follow.

Tinnitus in some form is usually associated with arteriosclerosis of the central nervous system type, and may be very severe. Patients with high blood pressure, originating in organic disease in contradistinction to the essential hypertension type, may manifest tinnitus as one of the early symptoms. In cases of the blood dyscrasias, the leukemias, polyemia, anemias and polycythemia, tinnitus and deafness are associated symptoms because of the plugging and congestion of the small end vessels. Occasionally, in valvular diseases of the heart, the bruit may be heard by the examiner. I have examined three such cases. Pelvic and abdominal disorders, as described by Woakes, are a well recognized cause of tinnitus. In early stages of pregnancy tinnitus may be a prominent symptom. Tinnitus has also been observed repeatedly at the Clinic in both pre-operative and postoperative abdominal cases. In fact, two very definite instances of patients complaining of tinnitus were found, on general examination, to have uterine fibromas, and their removal relieved the tinnitus. Postoperative tinnitus is a rather difficult symptom for the general

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surgeon to explain unless it is recalled that the nerves controlling the caliber of the vertebral arteries, and also the basilar artery and its branches, including the internal auditory, which supplies the labyrinth, come from the inferior cervical ganglion. The stomach and other abdominal viscera are largely supplied by the pneumogastric nerves, and the communication between the vagus and the inferior cervical ganglion is established by means of a fasciculus from the vagus to the inferior cervical ganglion.

Because of the injurious effect on the mechanism of the ear, constipation and gastro-intestinal stasis are more important factors than is generally recognized. A fair majority of deaf persons, particularly women, are constipated and often obstipated. The effect may be vascular and toxic. There are many other less common toxic factors. Focal infection may play its part in the same way. The effect that quinin, salicylic acid, and other drugs may have on the ear is well recognized.

Disturbances of metabolism, myxedema and its allied conditions, often present symptoms referable to the ear. The effect probably is secondary to the changes in the blood vessels and perhaps in the concomitant tissue changes. In a study of the mechanism of the ear in cases of myxedema, it was found that both the cochlear and vestibular branches of the eighth nerve might be involved. The function was usually below normal, in certain cases considerably below. It has been apparent that the state of health is an important factor in the condition of this special sense nerve.

Neurasthenia and allied disorders are the most common general and functional conditions which may have concomitant symptoms related to the ear, and it is in such cases that the otologist has the most difficulty in satisfactorily explaining symptoms to patients. Local treatment per se will not relieve the symptoms. In the syndrome of an acoustic neuroma, Cushing has shown that tinnitus is the prodromal symptom. Tinnitus, deafness, and vertigo may be the early symptoms of many complex cases of intracranial tumor, and special examination of the mechanism of the ear may yield information which will aid materially in the localization of the lesion.

Pain.—Pain in any part of the body will induce a patient to seek relief more often than any other symptom. Pain in the ear and mastoid, which is

not caused by inflammatory diseases, is encountered in daily practice. Because of the complexity of the nerve supply of the mechanism of the ear, there are many possible causal factors; among the more common are the otalgia and mastoidalgia due to unerupted third molar teeth, dental caries, and lesions in the pharynx and nasopharynx, as shown by New. Occasionally, glossopharyngeal neuralgia or neuralgia of the sphenopalatine ganglion is a factor; obviously, the treatment is not local. However, patients with nasopharyngeal tumor have been observed, who have had repeated incisions of the drum, and mastoid operations. Young adults have been seen in whom mastoid operation had been performed or advised because of otalgia, whereas the pain was really caused by an unerupted third molar, or a sphenopalatine ganglion syndrome.

Occasionally a patient complains of pain in the ear coming on early in the morning, which is relieved by arising and moving around. This occurs most commonly in patients past middle life. In large measure it may be overcome by using several pillows to sleep on. Recently I had a patient with this syndrome who is an eminent otologist, and he had suspected some trouble with the posterior sinuses. Pain in the ear, following exposure to wind, may be avoided by placing cotton in the canal.

Vertigo.—A most troublesome group of patients to deal with, from the standpoint of both otologist and internist, are patients with incapacitating vertigo, not infrequently accompanied by nausea and vomiting. This chain of symptoms is recognized as the Menière syndrome, which is the result of toxic neuritis of the eighth nerve. Any source of focal infection, all dietary toxic factors, the excessive use of tobacco, moonshine, and so forth, must be eliminated. There is great difficulty in the satisfactory management of this group of cases. Occasional attacks do not cease until the nerve is totally destroyed.

THE PROBLEM OF THE DEAFENED

The totally deaf person assumes that nothing can be done for him, but the person only partially deafened is constantly grasping for anything or any treatment that he hopes might restore his hearing, and often he is preyed upon. The problem of the deafened is not only the problem of the otologist, but the problem of the physician, friends, and

the clergy. Ordinarily, little may be accomplished with regard to restoration of the hearing in a large majority of the afflicted, but occasionally, in early cases of deafness due to disease of the nerve, rather striking results have been attained.

The mental attitude of the deafened person is paradoxical: he is generally morose and melancholy, and tends to isolate himself, which is in contrast to the blind person, who is happy, bright, and cheerful. I would prefer deafness. Edison says that he enjoys deafness because he can concentrate better. Physicians must show deafened people that the outlook is better than they expect. Hardly anyone objects to the use of corrective lenses for their vision, and the objection to the use of artificial hearing apparatus must be overcome. Employers must be shown that in certain lines the deafened make more suitable employees than individuals whose hearing is normal. In this state, a league for the "hard of hearing" is being formed, which deserves the moral support of the public. The science of lip reading is being developed to a remarkable degree, and I believe that in it lies the salvation of the deaf.

SUPPURATIVE DISEASES

All are familiar with the suppurative diseases, but I wish to call to your attention the fact that patients with infected sinus thrombosis have been treated for typhoid fever and bronchopneumonia, and that brain abscess has been overlooked as a complication from infected conditions of the ear.

SUMMARY

Symptoms referable to the mechanism of the ear may be grouped under three main heads: tinnitus aurium, deafness, and pain. Vertigo, with its sequelae, nausea and vomiting, is not generally thought of by the laity as symptoms referable to the ear. Many conditions other than those local to the mechanism of the ear may cause these symptoms. It is within the province of internists to recognize the causal factors. The problem of the deaf does not rest with the otologist alone.

DISCUSSION

DR. HORACE NEWHART, Minneapolis: I wish especially to thank Dr. Lillie for his excellent paper, for in it he has eloquently emphasized the point which I have been trying to put over for the past ten years in a feeble attempt to instruct our undergraduates at the University of Minnesota in otology. That point is simply this: The ear must not be looked upon as a disassociated organ taken apart from the rest of the body. This of course has been brought out in connection with the labyrinth, but I think we should also call special attention to the large number of cases of nerve deafness which we encounter, those in which the lesion is not so much in the middle ear but is found in the sound perceiving apparatus, the cochlear apparatus. These cases who come to us without any evidence of inflammatory disturbance in the middle ear but are hard of hearing, should be considered quite as much from the point of view of the internist as of the otologist. Therefore in such cases we should seek the cause in other parts of the body.

Dr. Lillie has called attention to the gastrointestinal tract. To illustrate the point let me say that recently we have had occasion to check up on a patient who had been the rounds of the different otologists for several years, had gone through all the classical operations of tonsillectomy, which perhaps was needed—undoubtedly was in this case—and straightening of the nasal septum. Yet the tinnitus persisted and the impairment increased. She was referred to the internist because we could do nothing to ameliorate her condition, and fell into the hands, through the internist, of the surgeon, who removed the gallbladder. The results in this particular case are so striking as regards the improvement in this patient's hearing, and diminution of the symptoms, that I feel I must call your attention to the possibility of gallbladder disease being a casual factor in nerve deafness, and suggest the gastrointestinal tract as a line of more thorough investigation.

To illustrate still further the suggestiveness coming from ear symptoms: A patient not over two years ago was referred to us by the internist because of the marked symptoms suggesting disturbance of the static labyrinth. The patient was extremely nauseated on arising in the morning, oftentimes could not retain food after she had gotten up, and was in an uncomfortable condition a good part of the year. Examination showed an extremely irritable labyrinth and nothing more. The hearing function was normal. Inspection of the middle ear showed nothing pathological. Yet on attempting to turn this patient in the turning chair, the reaction was so severe that it was almost impossible to carry out the procedure. She was referred back to the internist, who made a careful gastrointestinal examination, finding absolutely no free hydrochloric acid. The patient was cured of her vertigo and nausea in one week by putting her on the right track as regards the digestive tract.

IRRITATIO CONJUNCTIVAE

EDUARD BOECKMANN

St. Paul

With the eyes open, the greater part of the cornea and the bordering lateral sectors of the bulbar conjunctiva are, between the winkings, exposed to the air. The air is never pure but in mid-ocean, in the high mountains, in the arctics and partly in the woods. Our eyes are ingeniously, richly and beautifully supplied with both defensive and offensive armaments for protection against irritations and infections from the air. There is already some protection in the supercilia, but more so in the cilia themselves; there is protection in the sensibility of the skin, but vastly more so in the sensibility of the cornea, which is the most sensitive organ in the human body. On this sensibility depends the frequency of the winkings and the squintings of the lids, and on this sensibility depends the constant secretion of tears with their antiseptic virtues. The conjunctiva and cornea are furthermore protected by a delicate mucous film from the tubular glands in the conjunctiva and perhaps from the epithelium itself and there is a good supply of adenoid tissue particularly in the retrotarsal folds for direct action upon the prospective invader. Besides, the conjunctiva is richly supplied with blood vessels and with lymphatics with the preauricular glands for their rendezvous.

Thus the eye is by nature well prepared to meet the air and defend itself against the hostile elements it contains, and *legio* are the people who pass their span of life with little or no inconvenience, but another *legio* does not fare so well.

The air both inside and outside our dwellings is more or less saturated with ordinarily invisible impurities of all kinds. All of us can see them with the naked eye, when sunlight strikes a darkened room through an opening,—myriads of now visible particles, mineral, vegetal and animal (Pasteur); all of them more or less irritating to the eye; many of them infectious.

Pure air is an everlasting friend; impure air is an eternal enemy with which we are in constant fight and the open eye has all the time its share. No wonder that it will be rather difficult to find a perfectly normal, pale, smooth, thin and transparent conjunctiva, while the cornea, which is not a hiding place for "dust" and which gets the main

benefit from the winkings, remains immaculate but for frequent increase of conjunctival mucus, which moves over it in the shape of a thin veil, visible on close inspection with the winkings of the lids or demonstrable by oblique illumination or transillumination. Regularly the conjunctival sac is inhabited by some bacteria,—as a rule harmless saprophytes, which, however, may give rise to some chemical irritation but no infection. The conjunctiva is not a good breeding place for bacteria, fortunately; still, if we neutralize the winkings by bandaging the eye, making a tearless, quiet incubator of it, the bacteria will multiply considerably, for which reason I am an avowed enemy of tight bandaging except in certain cases. It is impossible for the winking eye to remove all the bacteria or other irritating elements that have invaded and even multiplied during sleep, when the eyes bandage themselves; a fight with nature will result and it is this fight that constitutes the objective picture of *irritatio conjunctivae* and which causes the subjective symptoms by irritation and poisoning of the sensitive nerves.

Irritatio conjunctivae—also called catarrh or eyestrain—is without comparison the most frequent of all diseases of the eye. It is an every-day disease and a disease for every doctor. Hardly anybody escapes it in some form or other. It begins early in life, becomes more and more frequent with age to include almost all old people. Still, most people experience little or no trouble and go through life without calling on the profession. It is particularly those who belong to the farm-laborers and who depend more upon their hands than on their eyes for their daily bread and who only read the newspapers or the hymn book, who don't pay much attention to a little conjunctival irritation. Those who spend hours with books in stuffy, illy lighted rooms, or in rooms with electric or kerosene lamps, which irradiate heat, and those not receiving adequate protection from shields or glasses, or failing to have the source of illumination behind the head,—those are the ones so often troubled from conjunctival irritation. It is particularly the nervous, high strung, hypersensitive people, that will suffer from *irritatio conjunctivae* more than the indolent. Consequently girls will often have more trouble from irritation than boys, and women more than men. But there is no reason to take girls and boys out of the school, simply because they suffer from *irritatio conjunctivae*. The eyes are made to be used and I think it

is a sane and safe advice to let them use their eyes for all they are worth. A night's rest is all the eyes need and idleness is no cure for *irritatio conjunctivae*.

Irritatio conjunctivae may not stop with the conjunctiva; it may invade the subconjunctiva, the caruncula, the semilunar folds, the cilia, the Meibomian glands, and the canaliculi—and often does. Finally it may extend to the episclera, the preauricular glands and the orbital contents. This invasion of the eye is usually bilateral, but often the one eye is invaded to a greater extent than the other.

Although *irritatio conjunctivae* may be the result both of physical, mechanical, chemical and parasitical elements, usually in combination, the bacterial invasion from the air is undoubtedly the most frequent cause. There may be more or less susceptibility in different individuals, but once rooted in the conjunctiva it becomes a more or less chronic condition. It may be and usually is impossible in a given case to prove the nature of the real offenders. I for my own part have more and more come to the conclusion that tuberculous irritation is not uncommon. It is difficult for tubercle bacilli to breed in the conjunctival sac and real tuberculous conjunctivitis is also a rare disease. I am very slow in accepting an endogenous origin of the same. This is, however, a disputed question. It seems to be easier for the tubercle bacilli to penetrate the conjunctiva and be carried to the subconjunctiva, episclera and the preauricular glands through the lymphatics. When I find indolent enlargement of the preauricular glands, I am always suspicious of the irritation being of tuberculous nature, well knowing that other elements can do the same. A close examination for the presence of preauricular glands with the tip of one's index finger should always be done in *irritatio conjunctivae*. If demonstrated at all, it always means they are enlarged, as the normal glands are so small that they escape our examination. It takes some experience, but will soon be learned by routine practice.

It has often been said that tubercle bacilli have a predilection for the lymphatic glands and the picture of the immense tuberculous glands of the neck is vivid in our imagination. They are not so frequent as they used to be. Fifty-four years ago the Danish physician, Wilhelm Meyer, advanced his adenotomy, which removes the obstructing growth but fortunately not the original adenoid tissue itself. This popular and beneficial operation is un-

doubtedly the chief cause of the reduction in frequency of tuberculous glands of the neck by striking at the focus of entrance. If tubercle bacilli have predilection for lymphatic glands, it must be the same predilection that criminals have for prisons, for the bacilli are carried thither by the lymphatics for imprisonment and destruction. Oftentimes they put up an awful fight, break jail like other dangerous and cunning criminals, pass to the next glands and even jump them to finally get access to the general circulation and appear in distant organs as metastases. But as far as the eye is concerned I am coming more and more to the conviction that metastatic tuberculous affections are more rare than those of ectogenous origin and that there is no need to deviate from beaten path of entrance through the conjunctiva itself.

Probably we have trachomatous irritations of the conjunctiva that do not develop into real trachoma. I have never found preauricular glands in such diseases. Irritation from Morax-Axenfeld's diplobacillus is common; likewise *irritatio conjunctivae* in "colds" and hayfever. We have *irritatio conjunctivae* from light, heat, electricity, gases and smokes. We have *irritatio conjunctivae* from face powders. We have artificial *irritatio conjunctivae* in patients who like to fool the doctor, and sometimes succeed for a while. And so on. But it always remains with the air and what it contains, to be the principal factor and *irritatio conjunctivae* due to refractive, muscular and accommodative errors are unknown to me.

The objective findings in *irritatio conjunctivae* vary in intensity, extent and character. They are often so trifling that they will escape a fleeting examination and be paid no attention. A moderate hyperemia of the conjunctiva of the tarsal plates—general or localized in the angular parts—is usually the first beginning. The tarsal conjunctiva loses somewhat in smoothness and transparency; still the Meibomian glands are visible. By continued conjunctival irritation the tarsal conjunctiva may hypertrophy and present a sandy or velvety appearance and obscure more or less the Meibomian glands. In protracted cases concretions in the goblet cells are not infrequently found. The retro-tarsal folds, which always should be investigated by pressing the globe backwards with the lids everted, one by one, will also often present both hyperemia and swelling, while the bulbar conjunctiva remains unchanged. There is generally some

mucous secretion, and while there may be a little dried secretion in the corner of the eye, there is usually not enough to stick the lids together in the morning. A frequent finding, particularly in children but also in adults, is more or less numerous follicles in the adenoid tissue of the retrotarsal folds. As the lower fornix is a better hiding place than the upper, it is here we find them in the greatest number. Both the caruncula and the semilunar folds may show hyperemia, hypertrophy and even follicles. The edges of the lids may be hyperemic and red as after crying; also seborrheic. The lacrymal puncta may in elder individuals be found small, contracted and even closed, in which case epiphora, which is uncommon in simple *irritatio conjunctivae*, results.

If the subconjunctiva participates in the irritation, the lids may be somewhat puffed and both the bulbar conjunctiva and the subconjunctiva will show a number of vessels running from the inner and outer canthus towards the cornea. The semilunar folds will show a tendency to be drawn forwards. The final result may be pinguecula, pterygium or both. If the Meibomian glands are involved, increased secretion in the form of a white scum in the inner angle is often seen. Pressing the everted lids against each other with glass rods or the fingers will bring out the increased secretion. If the episclera is invaded, we find the deep, bluish, ciliary injection, which can immediately be intensified if we part the lids and expose the eye to the air. The bulbar conjunctiva reddens very little on exposure to the air, while the tarsal conjunctiva does.

If the orbital contents are invaded, we can no longer use our sight. We must use our touch and examine for tenderness. The normal eye is indolent to palpation and pressure. Only the hypersensitive eye may rebel—sometimes even before we touch it. If the orbital sensitive nerves are invaded by the toxins of the conjunctival irritation, tenderness on palpation and more so on pressure will be complained of. The tender eye has received scant attention in the literature. It is to my mind and in my experience such an important finding, that I never consider an examination of the eyes complete without it and the examination itself is simple. Palpate or press the sclera particularly over the insertions of the muscles; after that push the eye against the orbital wall in all the different directions or bore your finger between the eye and the orbital

wall and you will soon find where the shoe presses. The finding of tender eyes is of the greatest importance for the treatment.

The subjective symptoms of *irritatio conjunctivae* vary considerably according to the degree, character and complications of the irritation and the disposition and social status of the patient. A good many people do not mind a little irritation at all. The ordinary complaints are that the eyes smart, itch, burn, feel sore and ache. Some complain that the eyes feel sandy and dry; some have a feeling of foreign body and a desire to wink and rub the eyes. Some are sensitive to bright or artificial light, others to radiating heat from the lamp or the stove. Complaints of eye-strain or asthenopia (conjunctival asthenopia) are general, especially among the "high-strung" and "run down." If the eyes are tender, they will all complain of tiring from near work, of tearing, of blurred vision, that the eyes will not "focus right," and also of headaches—toxic asthenopia and toxic headaches—which will be more felt in the evening by artificial light. The eyes will feel tired, heavy and sleepy.

Tenderness of the eyes is often more pronounced on the one side than the other, and if the eyes are tender there will often be morning headaches, which should not be attributed to eye-strain the preceding day. Tender eyes and headaches from overtaxing alone will disappear over night. Endurance both of accommodation and convergence will suffer in tender eyes. To work with tender eyes is pretty much the same as to walk on tender or lame feet.

TREATMENT

Optical treatment.—I have already stated that *irritatio conjunctivae* from refractive, muscular and accommodative errors is unknown to me. This statement is not in conformity with the general opinion in this country, where the slightest error is held responsible for the symptoms of *irritatio conjunctivae* with the result that every complainant gets his glass. Being an air disease, no glass of any description can prevent or cure conjunctival irritation. Overtaxing of the eye and refractive errors will aggravate the condition by the resulting passive hyperemia, which in turn will patronize multiplication of the bacteria present. The patients should consequently be given the benefit of what optical treatment may be of assistance and help in their work.

The human eye in civilized nations sees, in spite of its congenital optical imperfections, everything

that is necessary, and what our eyes do not see our hearts do not feel. Wild people may see two, three up to five times sharper than we. They may need this much for their existence. We do not need it for ours and we do not feel any envy. The wild man's eye is mainly for distance, which means more or less rest; the white man's eye is to a great extent for near work with strain both on the accommodation and convergence and needs the same rest, after a day's work, that the body does.

The most eyes are born hypermetropic (on an average 1.25 diopter) and also astigmatic (0.25 to 0.50 diopter). When the congenital hypermetropia does not exceed 1 diopter, we call the eye emmetropic or normal, and when the astigmatism does not exceed 0.25 to 0.50 diopter, we used to call it physiologic. In this country all astigmatism is called pathologic and held responsible for the symptoms I have attributed to *irritatio conjunctivae*. However, such a slightly hypermetropic and astigmatic eye should not and will not under ordinary circumstances give trouble, before the individual reaches the presbyopic age and should not need correction for their small imperfections. But they will all be fitted with glasses, as soon as eyes give trouble from hypersensitiveness, overtaxing and irritation. And many of those who are fitted with "physiological" glasses derive real benefit and declare they can not do without them, which is difficult to charge up to the low number, but easier to attribute to the glass as such, to the protection against wind and dust, heat and light, to a habit or to auto-suggestion. But all those who come to me with "unsatisfactory" glasses, that they cannot do without and that I myself cannot improve, I advise to continue with them, but not as a treatment for the conjunctival irritation I usually find present in such cases, but for protection pure and simple. A plain glass would probably do the same and such plain lenses I have in my trial case instead of the fractions of 0.25 diopter and in many cases I have found that plain glasses give the same satisfaction as the low numbers. But since it always is possible to find a low number that will fit, I consequently give the patients the benefit of what little improvement in clearness such a weak glass will bring. On the irritation itself these weak glasses have no influence.

The belief in the almighty glass has become so ingrown in the people that they go to the specialist, the optometrist, the optician or the traveling refrac-

tionist to get glasses when troubled with their eyes and head; only a small minority hope that it will not be necessary to be fitted. Each eye is tested and corrected separately and the patients are told to wear the glasses all the time. If the glasses don't prove satisfactory, the doctor says that the eyes have changed; but the next correction is no better. Another doctor is consulted; he must go his predecessor one better, but fails. And so it often happens that a patient presents himself with his pocket full of glasses,—all of them very much alike and of the lowest numbers and usually different for each eye. This is an almost daily experience. Not seldom has the patient been overcorrected after skiascopic examination on the dilated pupil with accommodation paralyzed and has gotten presbyopic glasses with reduced distant vision; and all of them are dissatisfied with the new condition of affairs.

The success of refraction work as such does not depend upon compelling the patients to wear constantly the glasses the doctor has in his wisdom prescribed. The patient is the last and real judge, and when he is not satisfied, while the glasses in themselves may be correct, I draw the simple conclusion that it is not a glass he needed but a medical treatment for what in the most cases will appear to be conjunctival irritation, which has not received any consideration or been overlooked. Irritation or no irritation, I am always of the opinion that people working under electric light should have "physiological" glasses for protection and that people exposed to wind and dust, or occupied with milking, harvest work or threshing should have glasses for temporary protection.

Since our eyes are not optically perfect, the professionals believe they should be rendered as perfect as possible with glasses and there is nothing to say to that—let people have what they want. But when glasses are indiscriminately prescribed for the treatment and cure of all possible eye troubles, it becomes a public nuisance. Every individual will become an eye-patient, if he lives long enough; but to consider every individual a born eye-patient, that shall have a glass as soon as a professional gets hold of him, shows certainly a sense of business but lack of understanding, experience or judgment. No wonder that so many people after awhile throw off their glasses, when they understand that they neither help nor beautify. Fortunately superfluous or even wrong glasses never

cause any injury to the eyes, only discomfort, besides being a costly experiment in the present times. It is not uncommon among the people to blame the glasses for having spoiled their eyes. This is unjust and I always tell them so frankly. Glasses are not made for health or decoration, but for comfort and protection.

The eminent Danish oculist, Edmund Hansen-Grut, a pupil of Graefe, wrote some fifty years ago, when fitting glasses in all possible eye troubles began to be an epidemic, that if the doctor would pay more attention to the patient's conjunctiva, he would generally find some catarrhal trouble and that treatment for this would make glasses superfluous and save a fortune. I felt guilty at the time, sat down and took notice and have remembered it ever since with increasing conviction of the truth of it. Still I often prescribe protection glasses as already stated. I never prescribe glasses that dim the distant vision and enlarge the print. And when I find that the patients have been overcorrected and got presbyopic glasses, I always change them, if the glasses have not already made them presbyopic, when they may need them for near work.

When I myself so often have disappointed my patients in my refraction work, which I have been at for fifty years, I do not hold my methods—the ophthalmometer, the ophthalmoscope and the subjective examination—responsible, although this examination in the American eye is unsatisfactory, as it does not include skiascopy on the dilated pupil with accommodation paralyzed. When I slip, it is either because my judgment has not been good or because I have overlooked or underrated the conjunctival irritation and missed the tender eye or that I have run up against hysterical and neurasthenic women whom nobody can please (*copiopia hysterica*, Forster). *Donna é mobile*. (*Rigoletto*.)

Local treatment.—A local disease requires a local treatment and generally people with *irritatio conjunctivae* not only get glasses but at the same time a prescription for simple lotion or eyedrops or salves. Salves do not do as well in conjunctival irritation as solutions. Their place is on the lids and their margins. To clean out and disinfect the conjunctival sac must be our aim. For cleaning out there is no better remedy than salt, boric acid or baborate of sodium solutions, all of which are non-irritating placebos that work mechanically and should be used in an eye-cup (mechanical house-cleaning). For disinfection of the conjunctiva we

have zinc, quinine, the different silver preparations, copper, alum and mercurial preparations, as calomel, sublimate and, last but not least, mercuriochrome. The disinfectant for the conjunctival irritation should preferably be as little irritating as possible. Therefore, nitrate of silver in 1 to 2 per cent solution has no place here. The other silver preparations I have long ago discarded, as I believe we have better chemicals at our disposal. The oldest, tried and most popular disinfectant or astringent, as it is called, is sulphate or chloride of zinc, which is claimed to have a specific action on the frequent Morax-Axenfeld's diplobacillus irritation and helpful in others. It is difficult to understand how a couple of drops instilled once or twice a day in the conjunctiva, which cannot hold even one drop and from which the drops are immediately expelled, can be of real antiseptic value. When experience nevertheless has proven the beneficial influence of such drops, many believe there must be some sort of biological action—chemo-biological action. If to zinc solutions is added adrenalin and cocain we have a really wonderful eyewater with increased action of zinc and with immediate relief from the astringent adrenalin and the anesthetic cocain. We are warned against the routine treatment with cocain. I myself do not know that I have ever seen anything that should prevent one from adding 0.5 to 1 per cent cocain to the solution. Adrenalin can be added freely, up to 50 per cent. I always add a little bisulphate of quinine to the zinc solution to increase its antiseptic properties. This gives the solution a beautiful fluorescent, bluish color. Such an eyewater or eyewash is very popular among my patients with *irritatio conjunctivae*. The only trouble is that they cannot refill the bottle without a new prescription. I have been so satisfied with this solution that I have not tried Butyn, which is non-narcotic and which does not require new prescriptions. For the same reason I have no experience with resorcin, while I sometimes touch the patient gently with alum and copper pencils.

A great man—Fuchs—writes great words about “collyrium adstringens luteum” (Horst's Eyewater)—“that it gives excellent success and is in many instances not to be replaced by any other.” It is a mixture of chloride of ammonium (0.4); sulphate of zinc (1.0); dissolve in 180 grams distilled water; add camphora (0.4) dissolved in dilute alcohol (20); add crocus (0.1), macerate through

24 hours, shake often and filter. Dilute it for use with 50 per cent distilled water. Having tried this for *catarrhus senilis*, I prefer a 1 per cent solution of mercurochrome, the new Baltimore germicide, which I have already mentioned in a paper on "herpes corneae" last year and which I will take the opportunity to give a special mention.

The originators of mercurochrome—prominent Baltimore urologists and chemists—have designated it "a general germicide, deeply penetrating, non-irritating, of low toxicity and of relatively quick action." It was originally intended for urological purposes, but was soon adopted and praised by the eye, ear, nose and throat men. I began using it for sterilizing the eye before and after curetting the cornea in *herpes corneae*. But I did not use it for daily treatments for fear it might be a cell poison and retard epithelization. Being a powerful antiseptic it is consequently not an epithelial food, but being of low toxicity the possible retardation of the epithelization is counterbalanced by the fact that it assists materially in keeping the eye aseptic, thus favoring the epithelization rather than retarding it. I have learned to know that mercurochrome is the simplest, safest, quickest, deepest and least irritating antiseptic we have for ophthalmological purposes—but not the most powerful; neither is it omnipotent. Thus in serpentine ulcers of the cornea, where we have no time for experimenting, I don't trust it alone even with frequent instillations up to 5 per cent solutions. But I do believe that any corneal ulcer during harvest time or threshing season should be immediately and repeatedly treated with 2 per cent solution of mercurochrome and I feel confident that this dreadful disease which causes the loss of so many eyes could be checked. Since we do not have a surplus of useful antiseptics, mercurochrome has been most welcome to me. We need a variation, since the eye will get used to one and the same remedy, which will lose in action. I experimented both with acriflavin, and proflavin, before I got hold of mercurochrome. They were good, non-irritating antiseptics, but hold no comparison with mercurochrome in my experience.

Mercurochrome is a mercurial compound with an intense, beautiful red stain. As this stain, which sticks long and has been difficult to remove, has been objectionable both to urologists and oculists, the same Baltimore men have lately presented us with another mercurial compound with "invisible" stain,—meroxyl. But in ophthalmology it cannot

replace mercurochrome, for it is said by the originators to be certainly a more powerful antiseptic but at the same time more irritating and toxic and less penetrating. I hardly believe it has any future in ophthalmology in spite of being non-staining. I personally have no particular objection to the mercurochrome stain; neither have my patients. It is true that red eyes and a red nose never have been considered decorative; but it is also true that the red stain from mercurochrome on the lids and face can quickly be removed by cold-cream or noviform ointment, and the conjunctival and corneal stain soon is removed by the tears or by any eyewater which contains cocain or, still better, holocain, which immediately will precipitate the stain, which henceforth will be removed by the tears. To control the staining of the face, I always make the instillations with the patients on their backs, protecting the face on either side with gauze.

Far from objectionable, I consider the stain itself a wonderful thing for immediate diagnosis of even the minute epithelial defects which it will color intensely for some time and which often are overlooked if not stained. We have heretofore used fluorescein for demonstrating epithelial defects in the cornea; but mercurochrome is much simpler and better, both for conjunctiva and cornea, and has in my practice replaced fluorescein entirely. If no epithelial defects, the natural or increased mucous film on the conjunctiva and cornea will only be passingly stained.

Mercurochrome is claimed to be non-irritating. It would be wonderful if true. It seems inconceivable that such a powerful germicide should be so. Still it is a fact that mercurochrome in 1 or 2 per cent solution, put into a normal eye, scarcely reacts on the victim. Thus, in disinfecting a normal appearing conjunctiva, preparatory to cataract operation, the patient experiences hardly any irritation. But if the conjunctiva is irritated, which is usually more or less the case in old people, and if the patient at the same time is hypersensitive, which old people sometimes are, smarting sensation will follow instillation, lasting usually a short time, being moderate in degree. I have seen cases of *irritatio conjunctivae*, where the eye after instillation with mercurochrome has burned like fire and caused so much misery that relief by cocain or holocain was appreciated. Such cases are, however, exceptions to the rule. Mercurochrome is not more irritating and for no longer time than anybody can stand

without kicking and consequently I have up to this time not disposed of it in any case and neither has anybody asked to be excused. I have never seen idiosyncrasy for mercurochrome or permanent staining. I further think that mercurochrome is a pretty reliable test not only for the degree of irritation, but also for the existence of irritation which the patient might not be conscious of himself. If mercurochrome produces only a moderate, temporary discomfort, no cocain or holocain should be instilled, in order to give the antiseptic full sway, and it can be properly instilled one or more times a day in any conjunctival, corneal or lacrymal trouble. In simple conjunctival irritation, once a day is sufficient.

Usually I give the patients prescriptions both for 1 per cent mercurochrome and for the named compound zinc solution from a stock solution, the formula of which is printed on the back of my prescriptions (boiling water 1000; glycerite of boroglycerine 50; quinine bisulphate 1; zinc sulphate 5; hydrocyanic acid, dilute, 15); cool and filter. For eyewash I add 10 per cent adrenalin and 0.5 per cent cocain; for drops I add 30-50 per cent adrenalin and from 0.5 (children) to 1 per cent (grown) cocain. If a couple of the "red" drops irritate, I advise to put in a couple of "white" drops afterwards; always in a recumbent position, in the corner of the eye with subsequent winkings or pulling down of the lower lid. Oftentimes I alternate—"red" drops one day and "white" drops the next. In old people I also prescribe Horst's eyewater for a change. Both the "white" and the "red" drops will deteriorate in time, for which reason I do not prescribe more than 30 grams at the time. Fuchs advises against putting in drops at bedtime, but he does not give any reason.

If there is only *irritatio conjunctivae*, the patients get along very nicely with the "white" lotion or drops and with the "red" drops. I never prescribe mercurochrome for eyewash, which requires sitting position and a towel. As the *irritatio conjunctivae* is a more or less chronic condition, often obstinate, I advise my patients to stick it out and not to drop the treatment too soon and to always have the remedies on hand.

In complications with subconjunctival irritation, which usually comes later and which is more chronic, troublesome and obstinate, the treatment is the same as for simple conjunctival irritation. In such cases I also try my way with salve—2 per

cent yellow oxide of mercury or 5 per cent noviform ointment. With a glass-rod I put some salve into the conjunctival sac, followed by a good rubbing or massage of the eye. Often the salves are not tolerated and must be dispensed with.

Red, squamous margins (seborrhea), which should always be looked for, should be treated with salves as the chief remedy. The salves should be as little irritating as possible. At this time I know of no better ingredient than noviform, made into an ointment with equal parts of distilled water, white vaseline and anhydrous lanolin, which is a cleaner product than the ordinary lanolin. The salve should contain from 3-10 per cent noviform. The best time for applying this salve is at bedtime. After good rubbing, the excess salve should be removed with the eyelids pinched together so that an anointed margin will be left for the night. If applied in the morning, all traces of salve should consequently be wiped off. I further advise to pluck out all loose hairs in the morning. Sometimes the vaseline itself is irritating. In such cases cold-cream may do better.

If the Meibomian glands are involved, the increased secretion can be removed either by lid massage or by pressing the upper and lower tarsus against each other on everted lids.

If the canaliculi, the tear sacs and the lacrymal canals participate in the trouble, if there is any epiphora, which very seldom results from simple conjunctival irritation except in hypersensitive individuals, the patency of the lacrymal ducts should be tried with instillation of 2 per cent mercurochrome in the recumbent position under vigorous winkings. If the system is patent, the handkerchief will soon show red stain. This test only shows that the system is patent, but not to what degree; it must be easy permeable to tears if epiphora does not result. Even the normal eye will tear in sharp air and wind. A simple hyperemia of the canaliculi is enough to hinder the tears from passing easily. Therefore, if the local treatment of the conjunctival irritation does not stop the epiphora, I slit the canaliculi to the opening into the sac, making a complete gutter of them. While there is hardly any bleeding from splitting a normal canaliculus, a hyperemic canaliculus will bleed freely. Often I find more or less stenosis in the canaliculi and even complete obliteration of the puncta. The epiphora will stop, provided there is no obstruction of the lacrymal canals, which, however, often is

the case. For this test I use an ordinary eye-dropper with a pointed, smooth tip, which I make myself and which at the same time allows a free stream. If the lacrymal canals are open, but little pressure on the bulb forces the water easily through. If that is not the case, I probe and dilate the canals with Theobald's probe No. 7 and 8,—only once as a rule; after that I let a syringeful of 1 per cent mercurochrome run through, with repetition every day. Next day the solution may not get through, but it often will during the next days without further dilatation, which, however, may have to be repeated. If there is real dacryocystitis present, I continue the instillation and injection with 1 to 2 per cent mercurochrome and since I have begun with this treatment, two years ago, I have never been compelled to operate on the sac one way or the other.

I am sighing now that I take up the treatment of the tender eye and headache. Up to now, I have held the conjunctival irritation responsible. I have not crossed the stream for water, but I may not have seen the woods for trees. When the accessory sinuses—the troublesome neighbors of the orbitae with their precious contents—gained such reputation that everybody with a cold and headache spoke of sinus trouble and the rhinologist let the oculist know that it would be to his advantage to consult the rhinologist before putting glasses on for aching eyes and headaches, I was so impressed by the idea that I referred everybody with tender eyes or headaches to my rhinological brother. Through blood-vessels, lymphatics and nerves the orbits communicate with the nose. The usual report was, that there was either nasal irritation, deviated septum, atrophic or hypertrophic catarrh, crowding on one side or the other, polypi or clear sinuses. The headaches were explained as vacuum headaches.

The nose, which inhales contaminated air day and night and exhales it again free from all contamination (Tyndall), tries to rid itself of the impurities which have settled down upon the mucous membrane, through blowing with a handkerchief or the finger. The rich man puts the product in his pocket, while the poor man gives it back to the earth from which it came. The result for the nose is the same, but there is lots left and colds in the nose and head are therefore a very common thing. That toxins from the mucous membrane of the accessory sinuses may invade the orbit through their thin bony walls and often do is beyond all

question. Real infections from the accessory sinuses have also at times invaded the orbit. How much of the tenderness and headaches in a given case should be attributed to the sinuses and to the existing conjunctival irritation is consequently impossible to say. It is possible that nasal irritation may pass through the lacrymal ducts into the conjunctiva and produce conjunctival irritation. This is, however, against the stream and is certainly rare. This is a disputed question at any rate. But whether the conjunctival irritation comes from the nose or originates in the conjunctiva, the fact remains that tenderness of the eye and headaches due to the orbital tenderness remain in spite of rhinal treatment, which should always be tried and which so often is beneficial to the patient's nose and attributes. Therefore, I shall continue to refer my patients with tender eyes and headaches to the rhinologist.

Tender eyes and headaches may also result from general conditions,—from rheumatism that troubles so many people in middle and advanced years. They may also result from supraorbital neuritis, not only ascending from the conjunctiva or the accessory sinuses, but also descending from intracranial or other causes. The region of the supra-orbital nerves is often the most tender spot. Tenderness and headaches from simple hypersensitivity alone is certainly not uncommon; it runs in the family. But, on the whole, I do believe that tender eyes and headaches most frequently are the direct result of conjunctival irritation. Not all patients with tender eyes complain of headaches, but all of them complain of asthenopia or eyestrain.

I have often found some relief from occasional use of headache tablets. I have found them to be better than aspirin, which is so advertised, so often resorted to and also prescribed for all kinds of headache. The special local treatment I most rely upon is rubbings and massage of the tender eyes. Some people are afraid of rubbing their eyes. I don't think the doctor told them so. Rubbing of the eye, which so many with conjunctival irritation and tender eyes feel like doing and also do, may be an instrument to press bacteria and other irritating elements into the subconjunctiva; but as there are always two sides to every question, rubbing may also be an instrument to drive the obnoxious elements out of the conjunctiva, for which reason I unhesitatingly and without regret have recommended not only general rubbing of the eye through

the lids in the usual way (we all do it), but also special massage of the tender spots with the fingertip wherever they are found, keeping it up gently until the tenderness is gone, which always results. If the patient would make a routine of such massage, he would soon learn to do it both properly and effectively. It is particularly recommended when the eyes have tired from near-work, when the eyes blur, the tears begin to come and the eyes and head ache from accommodation spasm and convergence. That is the time to take a little rest, lay off the glasses, if any, and spend a few minutes on the eye. The most tender spots will usually be found in the region of the ethmoidal and frontal sinuses, the supraorbital nerve and the inner recti muscles; also back of the eye, when pressing the eye backwards in the direction of the sphenoidal cells. Such massage hurts often more in the one eye than in the other, which might be perfectly free. Therefore be not too rough; all massage should be done with gentle fingers. Then go to work again. The oftener the eyes are massaged, the better.

Massage is a good adjuvant in the treatment of tender eyes from nasal, conjunctival or combined irritation and will always give relief if carried out for a long time, which I believe comparatively few people have patience to do; while hunting for curative glasses in otherwise normal eyes is like hunting for a needle in a haystack, I don't criticize the honest and conscientious doctor who wants to give the patients the benefit of the doubt. The people want glasses and let them have what they want; but let them particularly have the benefit of local treatment.

There is a natural cure for every disease. Unfortunately, people die while the cure is going on. There is also a natural cure for tender eyes and headaches and old people are really little troubled with any of them. Headaches is not an old man's or woman's trouble.

General treatment.—I always inquire about the general condition of my patients with conjunctival irritation. Children with conjunctival irritation, numerous follicles which by themselves many times do not cause any trouble, and with preauricular glands, and glands on the neck, I always refer to the nose and throat man with a plea to respect the tonsils, which are there for an important purpose and which should not be sacrificed unless they continually are so diseased that they are not amenable

to local treatments and the conclusion is drawn that they do more harm than good. Troublesome adenoids I like to see removed. I prescribe the old Iodide of Iron for internal medication in the anemic and scrofular; I further advise a vacation spent in the country away from the roads, preferably where there are woods, plenty of butter and fresh milk.

With conjunctival irritation in grown people, I always like to examine the urine and also to take the blood-pressure. What I examine for in the urine is not particularly albumin or sugar, but the specific gravity, color and toxicity (chromaturia indicanuria). A pale urine of low specific gravity means ordinarily nervousness in females and beer in males. Nowadays a man's urine is seldom pale, deplorably. The pale urine in girls tells me why they suffer more from the inconvenience of conjunctival irritation than men with normal specific gravity. They are invariably neurotic and hypersensitive. The toxicity of the urine from alimentary sources is very simple and easy to demonstrate by pouring some 70 per cent nitric acid into a small conical glass, half filled with the patient's urine. Between the heavier acid on the bottom and the lighter urine on the top there immediately appears, with great regularity, a zone of different colors with greatest intensity after a minute or two. A pale urine will give very little color zone; a normal urine—for instance, your own—will give more, and when the examiner has satisfied his mind what is normal and subnormal, it will be easy for him to judge the degree of increase. If albumin is present, it will appear directly above the colored zone. If the urates are increased, another white sharp ring will appear above the albumin (high and low ring). Increased toxicity of the urine (sapremia) requires a cleaning out to find out if it is only of passing nature. If it persists, a diagnosis should be made; but this does not belong here. Increased toxicity in old people means usually "weedy" colons and they cannot be weeded out with diet, medicine or with Metchnikoff's Bulgarian milk treatment. I let them eat or drink what they like and what agrees with them. Such chronic intestinal sapremia may be one of the causes of early senility with high or low blood-pressure; it may also be one of the causes of "rheumatism" of the eyes as well as the body; but we do not need to look upon it as a cause for "catarrhus senilis." I think these old people do much better with a general

nerve tonic, than with anti-rheumatic medicines and iodides. Thus my experience runs at least. So I give these old people what benefit there is in continued use of a favorite prescription I have adhered to for many years: Tinctura Nucis Vomica 50; Phosphoric Acid (dilute) 100; Tinctura Gentianae Compositae ad 500. Sig: A teaspoonful in a wine-glass of water before meals. This I give them whether the blood-pressure is high or low. It is a good prescription for old people,—a “pep” or “rejuvenation” preparation.

In pale, worn-out girls with pale urine, I like to take the hemoglobin test. If the coloring is below 70, I give them the same medicine, which they usually soon get used to in spite of its bitter taste. It works better than the same combination in “sugar-coated” pills. The mixture stimulates their appetite and gives them all the iron from the food they need. I have for many years turned my back on iron preparations without denying their usefulness in cases of anemia.

In sending out this humble message to the medical profession at large, I fully realize that I have not solved any medical question to universal approbation. It is only my personal views after fifty years' experience that I have expressed. Medical science is as infinite as the universe. The last word has never been and never will be said or written.

MANIFESTATIONS OF FOCAL INFECTIONS IN THE RESPIRATORY, CIRCULATORY, URINARY, AND GASTRO-INTESTINAL SYSTEMS IN INFANCY AND CHILDHOOD*

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The idea of focal infection is not new. Eyerlin in 1789 appreciated the relationship of tonsillitis and rheumatism. Benjamin Rush¹ in 1818 reported a case of rheumatism of the hip cured by extraction of a carious tooth. The principle of focal infection as a cause of acute and chronic systemic disease has now been fully accepted. It is made the basis for a large proportion (estimated as high as 70 per cent) of present medical prac-

tice. Credit for placing this work on the firm scientific foundation of today goes to Billings and Rosenow.

Billings² defines a focus of infection as “a circumscribed area of tissue infected with pathogenic organisms.” Foci may be located anywhere in the body—most often in the mouth, its communicating cavities, and regional lymph structures. At times a focus may be located in a most unexpected quarter. A great many pathogenic organisms have been found as offenders, those heading the list in frequency and importance being members of the streptococcic and pneumococcic groups. Systemic disease results when pathogenic organisms, their soluble toxins, or their debris set up pathologic changes in tissues or organs which may be contiguous to, or far removed from, the original site. Transportation occurs by hematogenous or lymphogenous routes. The list of diseases caused by focal infections is already too long for recital. Undoubtedly others will be added in the future.

With this very brief statement of the principles of focal infection we may proceed to our topic—Manifestations of Focal Infections in the Respiratory, Circulatory, Gastro-Intestinal and Other Systems. On these subjects volumes have been written, mostly, however, on studies concerning the adult; little has been done on infants and children. I can only briefly touch on a few of the disorders of infancy and childhood.

MANIFESTATIONS IN THE RESPIRATORY SYSTEM

During three-fourths of the year, in this latitude, respiratory infections provide the bulk of our everyday work. To the casual observer many of them are more or less trivial. However, bronchitis, broncho-pneumonia, lobar pneumonia, pleurisy, and empyema contribute heavily to infant and child mortality. These conditions, so often fatal, are rarely, if ever, primary—they are practically always secondary to infections higher up. Our wave of serious lung diseases occurs late in the winter and in the spring. It is preceded by waves of milder upper respiratory infections such as rhinitis, pharyngitis, tonsillitis, otitis, etc. What rôle does focal infection play in this? We believe a large one.

Repeated infections of lymphoid tissue and sinuses in and adjacent to the respiratory passages lead to: (1) loss of weight, anemia, and general

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debility in our little patients; (2) lowered resistance to bacterial invasion; (3) increased virulence of infecting organisms.

The stage is now all set for a serious illness which may follow a new infection, or if infection is already present may follow indiscretions in exercise, diet, clothing, etc.

I wish especially to emphasize the latter factor. We have just gone through a cycle when drafts and chilling as determining factors in infection have been scoffed at. But with our present mode of living we know that chilling of body surfaces profoundly affects the circulation in mucous membranes, predisposing to infection. Rosenow has also shown that chilling may increase the pathogenicity of bacteria in the tissues.

We feel, therefore, that removal of proved foci of infection along the upper respiratory tract will prove extremely valuable as a prophylactic. Our efforts should not be limited to surgical interference. Diet, cod liver oil, rest, and heliotherapy are valuable adjuncts.

ASTHMA AND FOCAL INFECTION

It may be true that asthma is most often an anaphylactic reaction to foods, pollens, dust and bacterial proteins. Walker³ has shown, however, that in the absence of positive protein tests the removal of foci of infection about the teeth and in tonsils may prove curative. Oftedal⁴ has shown that rabbits injected with streptococci from asthmatic sputum present foci of infection in the bronchial musculature.

A critical survey of an asthmatic must therefore include a search for focal infection as well as the performance of sensitization tests.

THE CIRCULATORY SYSTEM

When free from congenital defects the heart in infancy and childhood is peculiarly competent for its work. Changes resulting from sclerosis of vessels and chronic kidney pathology with resultant hypertension are rarely if ever met with in early life. Heart disease in children is preeminently a manifestation of focal infection. The relationship of tonsillitis, rheumatic fever, chorea, and heart disease is recognized by all. The experimental work of Rosenow⁵ adds scientific proof of the correctness of clinical observations. It would be superfluous at this time to carry the discussion to further detail.

I should like, however, to make a few observations as applied particularly to children's work.

1. Caries and abscesses about the deciduous teeth may be the cause of heart disease; therefore the same care should be given the first set of teeth as is awarded the permanent set.

2. The early removal of foci of infection in children often gives most gratifying results in heart disease. More may be expected than in the adult where long continued infection has produced chronic degenerative changes.

3. If not in acute decompensation the heart stands the anesthetic and surgical attack, incident to the clearing up of foci, unusually well. Murmurs may be disregarded in considering operative risks.

4. Paroxysmal arrhythmias (tachycardia) do rarely occur as the result of focal infection in the child. The exhibition of quinidin and allied drugs should not precede search for foci of infection.

5. Though difficult of statistical proof as yet, I feel our knowledge of focal infection and its appropriate application has greatly reduced the incidence of heart disease in childhood.

MANIFESTATIONS IN THE GENITO-URINARY SYSTEM

A. Nephritis.

In children the typical form of nephritis from focal infection is the acute glomerulonephritis: the mode of infection is hematogenous; the symptoms—lessened quantity of bloody urine, albumin, casts, and a soft edema. The attempts to demonstrate bacteria, presumably streptococci, have not met with much success. Grulee⁶ reports bacterial studies in six cases, and more recently Hill⁷ in twenty-one cases. Hill suggests an explanation for the failure to find the organism in the fact that cultures of the urine were not made at the onset of the disease. He also raises the question whether the kidney might not suffer from a soluble virus or toxin.

We do, however, recognize the clear-cut clinical picture of a chill, fever, leucocytosis, and other symptoms of an acute infection to be followed in a few days with bloody urine and the findings of an acute nephritis. In the sequence of events it is also the usual thing to find a focus of infection in an acute tonsillitis, otitis media, mastoid abscess, or cervical adenitis. We have all also seen a rapid subsidence of the nephritis after drainage of ab-

cesses at these sites, or removal of diseased tonsils. So, though bacteriological proof may be lacking in most cases, from clinical observations we must look for foci of infection in every case of acute nephritis in children.

B. Pyelocystitis and Pyelonephritis.

This is one of the most frequent diseases of infancy and perhaps one might say one of the least understood. It is a disease presenting the signs and symptoms of an acute infection—the presence of pus and the colon bacilli in the urine. It has therefore been assumed that the disease is due to an invasion of the kidney pelvis and kidney tissue with colon bacilli which gain entrance by one of three routes:

1. An ascending infection through urethra and bladder.
2. By lymphatic channels from the bowels—a normal habitat of the colon bacilli.
3. Through the blood stream.

Proof is accumulating that the disease is the result of focal infection. May I cite an illustrative case? A little female child entered the University Hospital with a severe pyelitis which cleared up after some weeks. An acute tonsillitis precipitated a sharp return of the pyuria, which again cleared up after some weeks. Thinking it good evidence of focal infection we advised removal of her tonsils. Removal of the tonsils and adenoids was immediately followed by a return of her symptoms, which again cleared up after a few days' treatment.

The idea of this disease being the result of focal infection appears illogical since the organism practically always found is the colon bacillus, and this organism is not found in oral sepsis nor infections of tonsils, ears, cervical glands, etc. However, the work of Bumpus⁸ furnishes almost indisputable proof that in pyelonephritis the streptococcus is the primary invading organism, which is quickly replaced by the secondary colon infection. This fits in with Hill's observations and again explains why a colon bacilluria may persist after symptomatic recovery from a pyelitis.

It would therefore seem wise to search for foci of infection in all cases of pyelocystitis.

MANIFESTATIONS ALONG THE GASTRO-INTESTINAL TRACT

In the adult the principle of focal infection has been accepted at least in part, *e. g.*, gall bladder infections. In children little has been done experi-

mentally, though clinically we recognize certain manifestations. Time, however, permits little more than their simple tabulation.

1. Cyclic Vomiting.

This disorder is often typically the result of focal infection. In the majority of cases the onset of an attack stands in close relationship to an upper respiratory infection. Conversely the removal of these foci, for instance, diseased tonsils, results in a high percentage of cures. Taylor's⁹ figures confirm this assumption. In some cases the focus of infection is found in the appendix, gall bladder, or kidney.

2. Gastric and Duodenal Ulcer.

Though this field is obscured by the smoke of the perpetual battle between the surgeon and the internist, it seems safe to conclude that ulcer may be the result of a focal infection. I bring this topic up for discussion, not as further proof, but call your attention to its unsuspected frequency in children. Holt¹⁰ reports ninety-five cases in infancy; Gerdine and Helmholz¹¹ report eleven cases and comment on its infectiousness and epidemic form. Palmer,¹² more recently, comments on its symptomatology. The condition is hard to diagnose, perhaps largely because we have not been on the lookout for the disorder. Careful observations and diagnostic methods will doubtless make it demonstrable when suspected and present.

3. Appendicitis.

We are all familiar with the picture of an acute appendicitis closely following an acute angina. Rosenow,¹³ experimentally, has produced lesions in the appendix in animals by the injection of organisms into the blood stream. Kritz¹⁴ believes that acute appendicitis is always hematogenous and never primarily caused by infection within the lumen of the appendix.

4. Mucous Colitis.

Preston's¹⁵ reports suggest that this disorder may be the result of a focal infection and not of necessity due to primary local disease.

5. Acute and Chronic Diarrhea in Infancy.

A most striking and frequently overlooked manifestation of focal infection is a certain type of diarrhea. Czerny labels it diarrhea due to parenteral infection. If a feeding case does not clear up on a reasonable routine, it might be wise to look for a source of infection outside the intestinal tract.

We have seen a most speedy cure, without change in the feeding schedule, follow drainage in chronic otitis media.

These remarks perforce are sketchy since the field is so enormously broad, but it is hoped that by mentioning the disorders and their presumed, if not proven, relationship to focal infection, that by careful histories, painstaking observations and complete reports we may eventually enlarge our knowledge so as to clear up the etiology of some puzzling systemic disorders of childhood.

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GASTRO-INTESTINAL MOTILITY*

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It is well from time to time for physicians to review the published results of work done by those in special fields; this is particularly true concerning the work of physiologists. As new and interesting facts are brought out they are too often published only in journals devoted to special work and are, therefore, not available to the average physician. As a consequence, physicians are accredited with a lack of interest in the results of experimental work and in their application to medicine. It is true that the study of normal function is didactic and to some is likely to be uninteresting. However, a review of the available literature on gastric and intestinal motility was undertaken and it is hoped that a short summary may be of interest to members of the Society.

It is not feasible to consider one part of the gastro-intestinal tract independently of other parts; yet time does not permit a full consideration of the subject and attention will be, therefore, directed more especially to the stomach with special reference to motility and to the control of the pyloric sphincter.

It is obviously unnecessary to discuss in detail the anatomy of the stomach; one or two interesting features only will be mentioned. The first of these concerns the arrangement of the musculature of the stomach walls. The wall is composed of three layers of muscular tissue, covered by peritoneum and lined with submucosa and mucosa. The outer layer of muscle is longitudinal, the middle is circular, and the inner is oblique. The middle coat is said by some authorities to be thickened in the plane of the incisura angularis, where greater demands are made upon the muscle structure. The circular layer terminates on the right by a piling up of the circular fibers to form the pyloric sphincter. The fibers of the inner layer are placed as U-shaped bundles which loop over the stomach immediately to the left of the cardia. The uppermost fibers of this layer run vertically downward over the whole length of the body of the stomach, both on the anterior and posterior surface. Jefferson describes the layer as having its right margin sharply defined,

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a narrow band extending from the incisura cardiaca to the pars pylorica. The contraction of this muscle, according to Kauffman, forms a canal underlying the lesser curvature and seen only when liquids and soft foods are taken. Lewis described the canal as seen in the fetal stomach and called it the *canalis gastricus*. As seen by Lewis "it follows the lesser curvature, appearing as a groove when viewed from the inside of the stomach. It suggests a continuation of the esophagus split open toward the gastric cavity, an open canal which may become a tube during its physiological activity by the approximation of its lips." In the adult, all anatomical trace of the canal has disappeared and yet the area functions, in many cases, as a canal and, as stated by Hartung, the first few mouthfuls seem to follow in grooved arrangement along the lesser curvature called the "*magenstrasse*" by the Germans.

The nerve supply to the stomach is from the pneumo-gastrics, the splanchnics and the sympathetics from the solar plexus. The plexus of Auerbach lies between the longitudinal and circular coats of muscle. The plexus is known also as the myenteric plexus and the local reflex, initiated by it, Cannon has named the myenteric reflex. All movements of the stomach continue after its separation from the body. This was shown as long ago as 1886 by Hofmeister and Schutz. Cannon showed that, after division of both vagus nerves and the splanchnics, there was a temporary lessening of muscular movement after which normal peristalsis was restored. These movements he believed to be initiated and maintained by the plexus of the Auerbach. He states that the function of this plexus is to insure an orderly progression of the contents of the gastro-intestinal tract.

The Myenteric Reflex.—While watching a rubber balloon in the small intestine Cannon discovered that if the wall of the intestine was pinched with a pair of forceps, a constriction at that point occurred, and at the same time there was relaxation below. In that way, propulsion of intestinal contents was effected down the tract. These movements he believed were initiated by the plexus of Auerbach and the reflex he called the myenteric reflex. Bayless and Starling were able to demonstrate the same movements under stimulation but preferred to designate the reflex by another term: "the law of the intestine." Cannon was not always able to demonstrate the reflex, the reason for which

could not be explained. Recently Alvarez in over two thousand stimuli applied to the intestines of rabbits was able to elicit the reflex only twenty times. In all other instances there was contraction both above and below the point stimulated. Alvarez believes that these results were obtained because the experiments were carried out upon the normally digesting bowel instead of one distended by a rubber balloon. The experiments are mentioned only to show the uncertainty concerning the nerve control of the gastro-intestinal tract, which, in accordance with the "gradient" theory of Alvarez, is limited to the regulation of tonicity in the muscles and co-ordination of the whole tract. The principal fact to be noted in this connection is that gastro-intestinal muscles will contract rhythmically after all extrinsic nerves have been severed and after Auerbach's plexus has been paralyzed by the application of cocaine or nicotine to the surface of the bowel. Peristaltic waves coursing over the normal stomach during digestion have been described by Cannon, Carmen, Cole, Case, Kaestel, Holzknacht and others. There is very general agreement as to the movements of the gastro-intestinal tract during its digestive phase with the one important exception, namely: the activities of the pyloric ring.

The Pyloric Sphincter.—The theory of the acid control of the pylorus was elaborated by Cannon. It was assumed that when the stomach was empty the pylorus remained tonically contracted. It continued to remain contracted until the ingested food attained a certain degree of acidity, when the sphincter relaxed and a small amount of the mixture escaped into the duodenum. The presence of acid in the duodenum was then supposed to cause a contraction of the sphincter. Briefly stated, acid on the pyloric side opens the ring and acid on the duodenal side closes it.

Carbohydrates, proteids and fats pass through the pyloric ring in the order named. Carbohydrates do not combine with hydrochloric acid. From that fact it is reasoned that the first acid secreted would cause a relaxation of the pyloric sphincter. On the other hand, proteids combine with hydrochloric acid; consequently, there is no free acid present for a considerable time after ingestion of proteids. Therefore, carbohydrates pass through the pylorus before proteids.

This theory has been accepted notwithstanding the fact that from time to time the clinicians have called attention to the fact that the stomachs of

patients having high acidity do not necessarily empty themselves more quickly than those having various degrees of subacidity and to the still more confusing fact that in cases of achylia gastrica the stomach empties most rapidly.

Cannon carried out his experiments upon animals, mostly upon cats. Of late a few men have been investigating the acid control of the pylorus in man.

McClure, Reynolds and Schwartz, in a series of twenty-two cases, passed into the duodenum a duodenal tube to inject acid and alkali, of varying strength. Their findings do not agree with those of Cannon in two essentials: (1) neither acid nor alkali, in any part of the duodenum, affect the opening or closing of the pyloric ring after a barium meal, as viewed through a fluoroscope; (2) differential discharge of food through the pylorus in man does not obtain, as it was found that barium meals of carbohydrates, proteids and fats are alike as to time of beginning evacuation through the pylorus.

Lockhart, Philips and Carlson, in recent experiments, found that in the human stomach there exists a relation between the gastric peristaltic waves and the opening and closing of the pyloric ring. When a peristaltic wave passed down over the surface of the stomach the pyloric ring was open for the escape of stomach contents. Upon the arrival of the peristaltic wave at the ring, it contracted and remained so until the approach of another wave. Cole previously demonstrated the same facts fluoroscopically and from a study of serial radiographs.

Wheeler and Thomas measured the contraction of both the pyloric sphincter and the antrum with an enterograph. They were able to demonstrate that both the pyloric sphincter and antrum show cycles of the same duration. The phases differ but show a constant type of alteration. These findings are not in accord with those of Cannon, who found that the pyloric ring opened and closed irregularly in response to chemical stimulation in either antrum or duodenum. That the control is not entirely one of motility is evidenced by the fact that the time required for the stomach to empty itself is influenced largely by the character of food ingested: for example, if carbohydrates only are given, the stomach will be found empty in three hours; fats require very nearly six hours and proteids almost as long. If fats are mixed with either carbohydrates or proteids, the former delay the

escape of both. Neither acid control nor motility accounts for these facts.

While apparently not undertaken for the purpose of disproving the theory of acid control of the pylorus, the recent experiments of Boldyreff actually do that. He found, as did Pavlov, that the percentage of hydrochloric acid secreted in gastric juice does not vary. Carlson has more recently confirmed the fact. The first secretion of gastric juice in an empty stomach was found by Boldyreff to contain 0.5 to 0.6 per cent hydrochloric acid. This percentage is rapidly lowered, even in the absence of food, to from 0.1 to 0.2 per cent. The lowering is largely effected through the regurgitation of bile and pancreatic juice. Boldyreff found that a high percentage of hydrochloric acid passing from the stomach causes an irritation and reverse peristalsis in the duodenum so that instead of a hurried evacuation of strong acid contents as should obtain in accordance with the theory of Cannon, there is the partial neutralization within the stomach. This mechanism Boldyreff designates as the self-regulation of the acidity of the contents of the stomach.

All that can be said with certainty at the present time regarding differential discharge of food through the pylorus was stated long ago by Pavlov: "That foods pass through the pylorus in the order in which they are liquefied and prepared in the stomach by the digestive juices acting upon them."

Hunger Contractions.—At the end of digestion the peristaltic waves gradually pass over into the hunger contraction of the empty stomach. They are not at once pronounced. The time of onset, after digestion, depends upon the age and physical vigor of the individual. In infants maximum contractions begin ten to sixty minutes after the stomach is empty; in adults from one to three hours. Carlson found that hunger contractions differ from peristaltic waves in that they begin high up on the cardia, while peristaltic waves have their origin just above the pyloric portion. He found that at times the contractions were so deep and rapid as to resemble the colonic peristaltic rush of Meltzer and Auer.

In this connection it should be stated that we are greatly indebted to Carlson and his associates, Lockhart, Dragstad, Philips, and others of his school, for the painstaking accuracy with which they have worked out many problems relating to gastro-intestinal function.

All normal individuals have at some time felt the pangs of hunger. Cannon and Washburn were the first to associate this sensation with muscular contraction of the stomach. Carlson and one of his associates fasted for five days in order to measure the strength of hunger contractions by means of an inflated rubber balloon placed within the stomach. He found the greatest distress on the third day, although there was progressive increase in the strength of the contractions to the end of the fifth day. These contractions are no doubt the cause of epigastric pain which is complained of so frequently by neurotic patients who take food irregularly and in small amounts. Lockhart and Carlson report cases in which very severe epigastric pains were produced by gastric contraction of the empty stomach in hypersensitive individuals. It is interesting to note the manner in which the theory of hunger pains in duodenal ulcer, as described by Moynihan, coincides with the gastric hunger contractions. It appears to be a clinical fact that when an ulcer is located on the lesser curvature it is the cause of less pain than when situated in more actively motile regions. This, of course, would not be true if complications were present. Contractions of the lesser curvature from the cardia to the incisura angularis are more shallow than those over the greater curvature. Kaestle, Rieder and Rosenthal proved this point by superimposing twelve photographs of a single contraction phase of the human stomach. The resulting picture showed but slight movement of that portion of the lesser curvature throughout the contraction. With ulcer in the pyloric region, where the contractions are strong and deep, the pain is the pronounced feature. The same is true when the ulcer is located in the duodenum. This also may be most plausibly accounted for when it is remembered that movements are normally very active at that point. Furthermore, Boldyreff found that acid escaping from the stomach intensifies movements in the duodenum, which at times are most active and may be reversed.

The Gradient Theory.—As previously stated, gastro-intestinal muscle functions independently of its nerve supply. To account for this fact Alvarez has advanced the gradient theory, which is based upon the fact that muscle has independent function and that there is a graded difference in activity from above downward. It appears that Alvarez has taken over the word "gradient" from the field of biology, where it is applied to the

process of development in all forms of life, both plant and animal. Child, in the study of the planarian worm, finds that development proceeds from before backwards and at the point of the greatest cellular activity the head always develops. As development progresses, it is found that the metabolic rate is greatest at the head and lowest at the tail. The metabolic rate is measured by the susceptibility of the embryo to certain drugs, notably potassium cyanide. Child, and also Hyman, believe that oxygen intake and carbon dioxide output are by that method accurately measured.

In applying the gradient theory to the gastro-intestinal tract, Alvarez has carried out a series of experiments over a period of several years. He has found differences in contraction rhythm of muscle as well as differences in irritability, in tone, in latent period, and, most important of all, a difference in metabolic rate. In each case, the result always depended upon the section of the intestine from which the specimen was taken. Activity progressively lessens from above downward. For example, the irritability of the muscle at the cardia was found to be greater than that at the pylorus and the irritability progressively lessened from the duodenum to within ten inches of the cecum. The same was found to be true concerning the degree of rhythmic contraction of muscle fibres. The power of independent rhythmic contraction was demonstrated by experiments upon fibers on the inner surface of the circular layer in which no remnants of Auerbach's plexus are to be found. When placed in oxygenated Lock's solution the fibers begin and continue for some days a rhythmic beating, the rate always depending upon the section of the tract from which the fibers were taken.

Alvarez believes the pace-making region for the stomach is high up on the lesser curvature, where the greatest irritability, as well as the highest rate of rhythmic contraction, has been noted.

These findings appear to offer some explanation for the reason that V-shaped excisions of the lesser curvature cannot be made without interfering with the emptying power of the stomach as was pointed out some years ago by W. J. Mayo. The truth of this statement has since been attested to many times by surgeons who have attempted the procedure. This theory appears to offer a solution for some other things which have heretofore remained unexplained.

Alvarez states that an ulcer near the pylorus

raises the irritability of that region to a point above that of the cardia with a consequent reversal of the gradient. This results in a delay in the emptying time of the stomach when no real obstruction is present. Again, the behavior of the bowel musculature in intestinal obstruction supplies evidence in support of the theory; if, as the author states, irritation or injury to the bowel will depress or reverse the gradient, it explains why the section of bowel immediately above the obstruction contains only gas and it offers an explanation for the cause of dynamic ileus, that one is at least able to understand.

In conclusion the work of Professor Keith should be mentioned. After a minute dissection of the plexus of Auerbach in many different regions of the gastro-intestinal tract, he was able to convince himself that each of four zones is controlled by a large group of ganglia cells situated within each zone. The theory is of interest because of the eminence of the author, but unaccompanied as it is by physiological studies a detailed résumé of his work will not be made.

CONCLUSIONS

1. The time of opening and closing of the pyloric sphincter is probably not influenced by hydrochloric acid but is governed by the same motor mechanism which controls peristaltic waves during digestion. Hydrochloric acid is an important ingredient of the gastric juice. It liquefies and prepares the food and in that way is an important element in controlling the differential discharge through the pylorus.

2. There is evidence to show that acid causes contraction in the duodenum. The contractions may be reversed, and when they are, the alkaline secretion present in the duodenum is forced backward into the stomach, reducing the acidity.

3. Hunger contractions coursing over a stomach may be the cause of distress or even pain. If there are pathological lesions present the epigastric pain may be intense. The pain is greatest in regions where contraction waves are deepest. Peristaltic waves do not cause the same degree of pain because of the presence of food in the stomach, which prevents an extreme degree of contraction.

4. Gastro-intestinal muscle has the power of rhythmic contraction, even when separated from its nerve supply. Auerbach's plexus is, therefore, a conductor and is not an initiator of stimuli.

5. In accordance with the gradient theory a bolus of food passes from above downward for the reason that pressure is greater above than below the bolus, due to contractions of myogenic origin.

6. The gradient may be depressed throughout the length of the intestinal tract because of illness. A single segment may have an increased rate of rhythmic contraction because of some irritation in the region of that segment. Reversed peristalsis with complete obstruction may result from a local intestinal injury.

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DIAGNOSIS OF CONDITIONS ASSOCIATED WITH SPLENOMEGALY*

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In nearly all conditions in which the spleen is diseased, it is enlarged sufficiently to be palpated at the costal margin. It is also usually true that a palpable spleen is the seat of disease, except in children, or in the comparatively rare instances of prolapse of the organ. Because of the spleen's physiologic function of blood destruction, this function in disease is often exaggerated and leads to severe anemia.

Even careful examiners often overlook the abnormal condition of the spleen. It may be mistaken for a tumor of the kidney, or for a mass in the retroperitoneal region. A well trained finger is necessary for the detection of the rather soft palpable spleen; if it is hard, with a sharp edge, it may be easily recognized. If it is not palpable by examination in the ordinary position, it may be palpated by having the patient lie on the right side doubled up, much as one lies in bed on a cold night, but with the abdominal muscles relaxed. Obviously the notch makes the spleen distinguishable from tumors of other organs, but this cannot always be felt. An important point in the diagnosis is that the spleen seems to come out almost flush with the costal margin, while a tumor of the kidney or one in the retroperitoneal region may appear to leave a sulcus between the costal margin and the tumor when inspiration forces it down. The spleen usually overrides other organs, while the colon is in front of a renal or retroperitoneal tumor, as recognized by tympany on percussion. Percussion and, par excellence, auscultatory percussion, is a much neglected but valuable method in diagnosis. Palpatory percussion and ballotement are of great value in cases of ascites.

In discussing the differential diagnosis of the conditions associated with splenomegaly, only a few of the main points in the diagnosis of each will be considered.

Cases of splenomegaly may be classified into acute and chronic; I shall discuss here only the chronic cases, the most important of which are those due to myelogenous leukemia, lymphatic leu-

kemia, Hodgkin's disease, chronic malaria, splenic anemia and Banti's disease, hemolytic jaundice, polycythemia vera, pernicious anemia, Gaucher's disease, von Jaksch's disease, syphilis (hereditary and acquired), tuberculosis, kala-azar, chronic infections, Still's disease, purpura, hepatic cirrhosis, obstruction to the portal vein, amyloid disease, and tumors.

The largest spleens usually occur in cases of myelogenous leukemia, Gaucher's disease, and kala-azar. The spleen may be almost as large in cases of splenic anemia or Banti's disease, and chronic malaria. In young children, from one to two years of age, the largest spleen is likely to occur in von Jaksch's disease. It varies in size, but usually is not so large in cases of hemolytic jaundice, polycythemia, syphilis, tuberculosis, Hodgkin's disease, Still's disease, lymphatic leukemia, chronic infections, and so forth. It may, however, become very large in cases of syphilis, tuberculosis, and Hodgkin's disease; in pernicious anemia, and in acute diseases it seldom is large.

Myelogenous leukemia.—The ordinary case of myelogenous leukemia may be easily recognized by the leukocyte count and enlarged spleen. Boothby of the Clinic is making a study of the basal metabolic rate and blood chemistry in such cases, which may be of some service in diagnosis. Thus far he has noted an increase in the basal metabolic rate and in the amino-acids of the blood. In cases in which the total leukocyte count is normal, the cases of so-called aleukemic leukemia, the differential count decides the diagnosis. Patients with a rare form of acute myelogenous leukemia are very ill, usually with a lower total leukocyte count, but many more immature cells. In certain cases in which the spleen is rather small and glands are somewhat enlarged, the diagnosis depends entirely on the differential count, but even so there may be many young cells that cannot be readily differentiated as belonging to the myelocytic or lymphocytic series.

Lymphatic leukemia.—In cases of lymphatic leukemia the lymph-glandular enlargement and continuously high leukocyte count, with 80 per cent or more of lymphocytes, are too well known to need repetition. Here also the total leukocyte count may not be increased, the diagnosis depending on the differential count. In certain cases the splenic enlargement may occur preceding the glandular enlargement, and thus lead to a diagnosis of mye-

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logogenous leukemia, especially if the cells are young, or of some other form of splenomegaly if the total leukocyte count is not increased. A number of years ago I observed a case in which the splenic enlargement was the outstanding feature, and at first the total leukocyte count was about 9,000. The high percentage of lymphocytes (about 80 per cent) led to the correct diagnosis even before the glands became enlarged. Before death occurred three months later, the glands and the spleen were markedly enlarged and the leukocyte count was about 90,000. The value of careful study of the cells with regard to maturity should be emphasized, as in this way a good idea can be obtained of the activity of the process. In the acute type of lymphatic leukemia the total leukocyte count often is not greatly increased, and the spleen usually is not enlarged. The acute illness of the patient and the rapidly fatal course of the disease are outstanding features. On the whole, in cases of lymphatic leukemia, the splenic enlargement is not a prominent feature in the disease.

Occasionally a case is observed in which there is a combination of clinical and laboratory evidence of the lymphatic and myelogenous forms, the so-called mixed leukemia. There is likely to be both glandular and splenic enlargement with a moderately high lymphocyte percentage, but also a rather high myelocyte count. At least one case of lymphosarcoma, in my experience (Case A379656) revealed the blood changes of lymphatic leukemia. The spleen was very large; the leukocytes numbered 82,200, the lymphocytes were 92 per cent. After the application of radium, the spleen subsided greatly, and leukocytes numbered 6,900, but lymphocytes were 75.5 per cent. Before the patient died, distinct signs of pulmonary trouble appeared, which were thought to be due to leukemic infiltration of the lung. At necropsy definite lymphosarcoma of the spleen, lungs, liver, stomach, kidneys, intestines and lymph nodes, and a great many mitotic figures were found.

The rather uncommon cases of infectious lymphadenopathy and lymphocytosis should be mentioned here. Many or all lymph glands may be enlarged; the leukocyte count almost resembles that in cases of lymphatic leukemia, except that the lymphocyte percentage ordinarily is not so high. On careful scrutiny of the cells, however, they are seen to be mature lymphocytes, rather than varying numbers of younger forms, as is seen in cases of

leukemia. Such cases are extremely difficult to differentiate, and only time can make one absolutely sure of the diagnosis. Case A21154 was of this type. The glands in the neck were enlarged. Leukocytes were 22,600; lymphocytes 80.5 per cent. The patient's tonsils were removed and radium applied to the glands and spleen. Sixteen months later the glands had almost entirely subsided; the leukocytes were 10,500 and the lymphocytes 40.5 per cent. The patient is in excellent health three years after the onset.

Hodgkin's disease.—The spleen is usually not greatly enlarged in cases of Hodgkin's disease. The symptoms are well known, but attention should be directed to the itching that occurs in many of these cases. I often find it necessary to excise one of the easily accessible glands for microscopic examination to clinch the diagnosis. In the so-called splenic Hodgkin's disease in which there may be little or no glandular involvement, diagnosis is difficult. The condition may be mistaken for another type of splenomegaly until operation or necropsy reveals the correct condition. Occasionally lymphosarcoma may present the clinical picture of Hodgkin's disease, and microscopic examination will reveal the condition.

Chronic malaria.—In some cases of chronic malaria, the spleen, as is well known, is large and hard, the so-called ague cake. Held asserts that the organism may be more readily discovered by examining the blood forty-eight hours after the subcutaneous injection of 1 c.c. of 1:1000 solution of epinephrin to force the organisms out of the spleen. Certain of the more serious splenomegalies should not be confused with this disease, as so often occurs. We do not often find, in this part of the country, a very large spleen attributable to malaria.

There is a small group of cases presenting the other evidences of splenic anemia, in which there is a history of malaria, or of the patient's residence in a malarious district. The blood findings in these cases may not be distinguishable from those in cases of splenic anemia. I do not recall, however, any case of this kind in which the organisms were recovered from the blood, and therefore the diagnosis of malarial splenomegaly with secondary anemia is somewhat conjectural.

Splenic anemia and Banti's disease.—The diagnosis of splenic anemia depends on the existence of splenomegaly, varying degrees of anemia of the secondary type, usually leukopenia and relative

lymphocytosis, and the frequent occurrence of gastric and intestinal hemorrhages. Because of the hemorrhages, the condition is often diagnosed gastric or duodenal ulcer, the splenic enlargement, even though considerable, being overlooked or disregarded. It should be emphasized that, in cases of gastric or intestinal hemorrhage, splenic anemia must be eliminated as a cause. In the later stage of the disease (Banti's disease) the existence of a very large spleen and ascites due to the associated hepatic cirrhosis, together with the foregoing findings, usually suffice to make the diagnosis. Sometimes it will be impossible to separate the condition from primary hepatic cirrhosis with splenomegaly. The existence of a large liver and a comparatively small spleen or an atrophic liver with rather a small spleen, especially if ascites is present, favors a diagnosis of hepatic cirrhosis. Occasionally syphilis presents such a picture, as occurred in a case in the Clinic recently (Case A415425). Norris, Symmers, and Shapiro believe that all cases of so-called Banti's disease are due to syphilis. The importance of diagnosis in this disease is even greater than its difficulties, since splenectomy in early cases leads to marked improvement or cure.

Hemolytic jaundice.—This condition may be either congenital or acquired. Its chief characteristics are splenic enlargement, usually moderate, an icteric tinge of the skin and sclerae, the absence of bile in the urine and its presence in the stool. Several members of the same family may be affected. The red cells are much more fragile than normal, as shown by the fragility test in which their resistance to hypotonic salt solution is determined (Ribierre). Schneider's test of the urobilin and urobilinogen content of the bile obtained from the duodenum by a Rehfuß tube is of much value. This test shows a practically constant increase of urobilin and the appearance of urobilinogen, running as high as 10,000 units of the combined pigments, whereas 1,000 units is fixed by Schneider as the upper normal. This increase of urobilin and the appearance of urobilinogen in the bile, is probably the result of increased blood destruction, and the consequent conversion of the liberated hemoglobin into an increased amount of bile pigment. However, the rôle of hemoglobin in the formation of bile pigment is not settled. The appearance of these two pigments and the absence of the normal bile pigments in the urine are of value in the diagnosis. The tests for the fragility of erythrocytes

and for abnormal bile pigments are the strongest links in the diagnostic chain of this disease. The number of reticulated cells may also be important, since they reach their highest numbers in this disease, that is, 10 to 20 per cent.

The frequency of gallstone attacks in cases of hemolytic jaundice must be taken into consideration since the jaundice is often attributed to such attacks. In Giffin's series of cases, 58 per cent were associated with gallstones. Needless to say, such jaundice is not relieved by cholecystectomy, but usually completely disappears after splenectomy. Certain of these cases resemble cases of pernicious anemia, but in pernicious anemia the fragility of the red cells is decreased while in hemolytic jaundice it is increased. Usually the spleen in pernicious anemia is not so large, the percentage of reticulated red cells is much smaller, and the urobilin and the urobilinogen values in the duodenal contents are not so high. The apparent good health of the patient with hemolytic jaundice contrasts markedly with his weakness when he has pernicious anemia, but occasionally a patient with hemolytic jaundice may be very anemic and weak. Even the hemoglobin indexes of the two conditions may be similar, but with hemolytic jaundice the color index is usually below 1, averaging 0.8. Occasionally a strongly positive Wassermann reaction is obtained in a case in which syphilis is not otherwise demonstrable. It may be difficult to make a diagnosis in a few cases in which biliary cirrhosis and hemolytic jaundice appear to be combined.

Polycythemia vera.—In polycythemia vera, or Vaquez-Osler's disease, the outstanding features, clinically, are the intense bluish-red or intense red of the skin, especially of the face, and mucous membranes, particularly of the lips and tongue; certain patients appear almost cyanotic. They often have headache and sometimes high blood pressure. The spleen varies greatly in size, and occasionally it is not palpable. It never reaches the enormous size seen in cases of myelogenous leukemia, or Gaucher's disease. The most important laboratory finding is the increased number of erythrocytes, varying from 5,500,000 to 10,000,000, or, as in a case observed in the Mayo Clinic, to 14,000,000. The hemoglobin, by the acid hematin method of estimation, is increased; the readings by the Dare method, however, are often very inaccurate. The blood viscosity is practically always increased, as is the total blood volume, in some

cases being more than twice the normal. Naturally, the cell percentage of the total blood volume is increased sometimes much above the normal of 43 to 45 per cent. In a recent test one patient (Case A405531) had 224 c.c. of blood for each kilogram of body weight, whereas 90 to 95 c.c. is normal. All but 67 c.c. of this was cells. The highest erythrocyte count was 7,080,000, and the acid hematin estimation of hemoglobin was 174 per cent. The viscosity was greatly increased; 1:15 and 1:14.2, at two readings, as compared with the normal of 1:4.5. The leukocyte count in this case was high, at one time 39,800. The principal complaint was weakness, and swelling of the feet. The skin and mucous membranes were an intense bluish-red; the eyes were bloodshot. On account of the increased viscosity, such patients are likely to develop thrombosis, as this man did from puncture of the vein. He died about three years after the onset of the disease.

Brown and Giffin have made some interesting observations on the blood capillaries in cases of polycythemia vera. They found that in many capillary loops the arterial portion is not dilated, but that the venous side of the loop is usually markedly dilated. Polycythemia may be overlooked and diagnosed as a neurotic complaint, unless a careful blood count and hemoglobin estimation are made on all patients with unusually red or bluish-red facies and mucous membranes. In cases of polycythemia of congenital heart disease, the cell and hemoglobin values may also be high, but increased total blood volume may be lacking and the murmurs and other signs of congenital heart disease present. The spleen is seldom enlarged. One recent case, observed at the Clinic, presented the laboratory evidence of polycythemia vera, with the physical findings of congenital heart disease. In certain cases there is a resemblance to polycythemia in the facies, but laboratory evidence and the enlarged spleen are lacking. This condition appears to be capillary hypertrophy.

Pernicious anemia.—In cases of pernicious anemia, splenomegaly is not constant, and is seldom marked. It is distinguished by the almost characteristic blood picture, sore tongue, achlorhydria, paresthesias and other nerve phenomena, and extreme weakness, ordinarily without much loss of flesh. The usual blood picture of low hemoglobin and erythrocyte count, high hemoglobin index, marked irregularity in shape and size of red

cells, and the frequent presence of megaloblasts, is too well known to need repetition. Sufficient attention often is not paid to the soreness of the tongue, and its atrophic appearance, the achlorhydria and the neurologic symptoms and signs, and too much is expected of the blood count. By carefully considering these features, diagnosis may often be made long before the blood picture becomes characteristic. Here again the Schneider test of the amount of urobilin and urobilinogen in the material obtained by duodenal tubing, and the examination of the fresh urine for the same pigments may be important, and second only to the findings in hemolytic jaundice, the average in the duodenal contents being about 3,000 units. Individual cases will vary from time to time. The reticulated erythrocytes are likely to be increased to between 2 and 5 per cent. The low leukocyte count and relative lymphocytosis may also aid in the diagnosis; a low platelet count is the rule. Occasionally a case is observed in which the blood picture is that of pernicious anemia, with free hydrochloric acid in the gastric contents, the spleen usually more or less enlarged and neurologic findings absent. This may or may not be another type.

Acute aplastic anemia is often confused with pernicious anemia, and is sometimes classified with it. The rapidly fatal course, absence of glossitis and neurologic symptoms, persistent very low leukocyte count, low platelet count, absence of nucleated erythrocytes, absent or much reduced reticulated cells, and the lack of increase of urobilin and urobilinogen in the duodenal contents and their absence in the urine, serve to differentiate it. The findings correspond to the lesion, namely, a rapidly progressing fatty change of the bone-marrow.

Sprue may be confused with pernicious anemia on account of the sore tongue, diarrhea, achylia and anemia, but may ordinarily be eliminated by examination of the duodenal contents and urine for abnormal bile pigments, neurologic examination, reticulated cell count, and the recovery of the specific monilia psilosis of sprue in the stool.

Pellagra may be confusing because of the sore mouth, tongue, diarrhea and achylia, but also distinguishable by the foregoing laboratory tests, and the characteristic skin changes. The exact relationship of pernicious anemia, sprue, and pellagra is not clear. A patient with pernicious anemia may not be anemic when he appears for examina-

tion, and even though very anemic may be only pale and not the usual greenish yellow.

Gaucher's disease.—This condition is not often encountered. Previous to 1920 there were only twenty-four cases reported in the literature; it is probable, however, that many cases have been overlooked or not reported. The spleen in Gaucher's disease may be as large as in myelogenous leukemia. The conjunctival and microscopic findings are characteristic.

Von Jaksch's disease.—The enlarged spleen in these cases is usually found in children from one to two years of age; it is generally accompanied by rickets, and sometimes by hereditary syphilis. It has no characteristic blood picture, but the large spleen, the age of the patient, and the rickets, usually identify the condition.

Syphilitic spleen.—The enlarged spleen of syphilis presents nothing characteristic in itself and is differentiated by the presence of the positive Wassermann reaction, a history of acquired or hereditary syphilis, and physical evidences of this disease. In a case observed in the Mayo Clinic recently there were symptoms and signs, including gastric hemorrhages, of Banti's disease. Every case of splenomegaly should be investigated for syphilis. The positive Wassermann reaction occasionally obtained in cases of hemolytic icterus and of pernicious anemia does not necessarily indicate syphilis.

Tuberculous spleen.—This condition can only be suspected, but it may occur either as a so-called primary condition, in which case the spleen may be large, or it may occur as a phase of miliary tuberculosis. Tuberculosis elsewhere in the body should not lead to the hasty diagnosis of tuberculous spleen. The condition may even be associated with anemia, resembling pernicious anemia, as was pointed out by Giffin. Its presence should always be suspected in any case in which splenomegaly is not otherwise definitely accounted for. The history of former ascites should excite suspicion.

Kala-azar.—The splenomegaly of kala-azar or Leishmaniasis need not be considered in the diagnosis of splenomegaly unless the patients reside in, or come from districts in India, Africa or Sicily. The diagnosis is made by finding characteristic Leishman-Donovan bodies in the material obtained by splenic puncture.

Chronic infectious splenomegaly.—Many cases of splenomegaly seem to be due to chronic septic

infection in various areas in the body, especially the tonsils and teeth, and associated with furunculosis, phlebitis, arthritis, nephritis, and so forth. The diagnosis can be made only by finding infection elsewhere, and excluding other causes. The spleen, in such cases, usually is not large, but it may be enormous.

Still's disease.—The splenomegaly occurring in Still's disease probably belongs to the chronic infectious group. It is a rheumatoid arthritis, usually occurring in childhood and youth, accompanied by splenomegaly; and glandular enlargement.

Purpura.—The splenomegaly occurring in purpura may be classified with the chronic septic infections. The spleen is a menacing factor in the disease, since, as has been recently shown by Brill and Rosenthal, its removal leads to a symptomatic cure. In one case in the Clinic (Case A413241) hemorrhage from the uterus, uncontrollable by any other means, was entirely cured, and the patient restored to apparent health by splenectomy. In such cases the diagnostic features are purpuric spots, positive tourniquet test, low platelet count, markedly prolonged bleeding time, but usually normal coagulation time of the venous blood. The tourniquet test consists in applying the arm band of the blood-pressure instrument at a pressure impeding the venous return, but not preventing the entrance of blood, usually about 100 mm. for three to five minutes. If the test is positive, small petechiae will appear on the skin of the arm.

Hepatic cirrhosis.—Certain of these cases with splenomegaly and ascites do not correspond to the Banti type of splenic anemia, and are diagnosed by the absence of the suggestive blood findings and the occurrence of jaundice. Occasionally, in cases of portal cirrhosis, the spleen is enlarged. The diagnosis depends principally on the enlarged liver, and jaundice without ascites.

Obstruction to the portal vein.—Splenomegaly due to portal obstruction may be suspected when sufficient cause exists, such as carcinoma of the stomach, pancreas or gallbladder, and Hodgkin's disease. Ascites will usually be present; jaundice may occur because of the pressure on the hepatic ducts. The obstruction may also be due to recurrent abdominal phlebitis, and portal thrombosis.

The splenomegalies of less frequent occurrence, such as are due to amyloid disease, tumors, cysts, hemorrhage, injury or twisted pedicle and the acute splenomegalies, will not be discussed here.

GENERAL DISCUSSION

Schneider's test of the urobilin and urobilinogen values of the duodenal contents has thus far been of diagnostic value only in the anemias associated with hemolysis, notably pernicious anemia and hemolytic icterus, increased values occurring constantly in the latter and in about 85 per cent of cases of the former. The total combined values are normally not more than 1,000 units, and the appearance of urobilinogen is abnormal. The presence of urobilin and urobilinogen in the freshly voided urine has the same significance as their excess in the duodenal contents. Care must be taken to test the fresh urine, since on standing, urobilinogen is quickly converted into urobilin. The fragility test is of value only in distinguishing hemolytic jaundice from other conditions. In the normal control, hemolysis usually begins in about 0.42 per cent sodium chlorid solution, and is complete in about 0.32 per cent, while in hemolytic icterus it may begin even as high as 0.6 per cent and be complete at 0.46 per cent; but the average is 0.52 per cent for beginning hemolysis and 0.4 per cent for complete hemolysis. The viscosity of the blood is considerably increased in a number of diseases, but in diagnosing splenic conditions its use is confined to differentiating cases of polycythemia vera; it is practically always increased in this disease. Its normal is about 1:4.5. The blood-volume and cell-volume estimations in the diagnosis of splenic conditions are of value practically only in cases of polycythemia vera. The normal is about 90 to 95 c.c. of blood for each kilogram of body weight, while 43 to 45 per cent of this is cells. Both or either of these may be variably increased in polycythemia vera. The study of the capillaries seems to be of value in distinguishing polycythemia vera from conditions resembling it. A count of the reticulated cells is important principally in determining the degree of blood regeneration, and of practical importance in the diagnosis of hemolytic icterus, in which the values may be 10 to 20 per cent, and in pernicious anemia with values usually of 2 to 5 per cent as against the average normal of 0.3 per cent and normal limits of 0.1 to 1 per cent.

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DISCUSSION

DR. EDWARD L. TUOHY: This very able survey of the spleen is deserving the closest analysis and study. There are only two or three features I would care to emphasize. The one has to do with an observation of a patient that I reported some two or three years ago after a similar report had been made by the Chairman of this Section, Dr. Giffin. These were cases of extreme chronic increases in *normal leukocytes*, so-called "hyper-leukocytosis." At that time I reviewed the literature, and was impressed with the apparent fact that wherever we have hyper-function of the bone marrow the spleen enlarges. That point is deserving of consideration.

Another feature I wish to call your attention to comes to mind because of a remark made by Dr. John Rose Bradford (the man whose name is so identified with the condition of Massive Collapse of the Lung) while giving a clinic in London a year ago. He asked a group of doctors if any of them had ever seen a case of spleno-myelogenous leukemia in its inception, and apparently no one had seen one. In other words, most of them come to the doctor when the spleen is large. I kept that in mind and on my return had it called to my attention by one of my confreres that a patient we had seen on account of discomfort in the upper left quadrant,—a rather indefinite portion of the human anatomy in any case,—returned a year later with a full fledged picture of spleno-myelogenous leukemia, and unquestionably we had not recognized it in the beginning.

I was treating a patient for a very manifest syphilis and

she returned and casually complained of pain in the upper left quadrant. We made blood counts and found that our patient had spleno-myelogenous leukemia with a rather mild increase in blood count. The spleen could just be felt. Under intensive roentgenotherapy and the continuance of the treatment for syphilis that patient has remained in *statu quo* for just about two years. The leukocyte count has never come down to normal and the abnormal relationship of leukocyte still obtains. So I think I can safely answer Sir John Rose Bradford's question and state that I "have seen a case of spleno-myelogenous leukemia in its inception." I saw one previously but I did not know it.

The other feature I wish to call your attention to is that there have been a number of cases in the literature having to do with abdominal injury, followed by damage to the splenic vein, resulting in enlargement or combined with it a condition of gastric hemorrhage as mentioned by Dr. Conner. That must not be forgotten in determining the cause of unusual splenomegaly. The damage to the vein produces enough trouble to lead to thrombus, which in turn is followed by varices in collateral vessels. The spleen is a most interesting organ and it is entirely wholesome to take this broad view of it and make the analysis as given by the essayist.

DR. J. P. SCHNEIDER: I think the doctor is to be congratulated on covering the field so thoroughly. I merely want to touch upon a few points that occur to me. A principle that it is well always to bear in mind is that of the influence of age. Regardless of the pathology causing splenic enlargement, the younger the patient the larger will the spleen become. Hence, ordinary Laennec's Cirrhosis in children will frequently present a relatively very large spleen and often lead to an erroneous diagnosis of Banti's disease.

I was misled by a negro patient, who had a very long-pediced fibroid in the left hypochondrium and which was mistaken for an enlarged spleen. Particularly in the negro race, fibroid disease of the uterus may give rise to pedunculated fibroids. One further condition that sometimes is mistaken for a primary splenomegaly is a non-hemolytic streptococcal endocarditis with an enlargement of the spleen. I have seen a three hundred per cent en-

larged spleen as the result of infarction in this condition. Very frequently the endocarditis will be overlooked.

DR. H. T. HELMHOLZ: I have been very much interested in this paper because of the unusual number of enlargements of the spleen that we have seen in Rochester in children, and one in particular that I should like to recount in view of what Dr. Tuohy just said. A boy of about nine years of age, three years before, had received a 22 revolver shot in the right chest, the bullet lodging opposite the first lumbar vertebra. The child made a perfect recovery and as far as his father knew was perfectly well. He was brought to us and we found an enormous spleen. The spleen extended beyond the midline to the right and to the anterior superior spine on the left and midway between the umbilicus and the symphysis in the midline. Practically every one of the factors that Dr. Conner has brought up could be excluded by examination and the possibility of an injury to the splenic vessels having occurred suggested itself. We thought that that possibly might have been the cause. The spleen was removed and the splenic vessels were found to be intact but there were thrombi throughout the entire spleen.

DR. H. Z. GIFFIN: If as Chairman I may be allowed to say a word, I should like to call attention to two groups of polycythemics in which diagnosis is frequently difficult. The first is the polycythemic with pallor, and the second, one who has become anemic from loss of blood. In these two groups, an accurate history, estimations of the total blood volume and of the red cell volume, and the testing of the viscosity of the blood are most important. The polycythemic who has become anemic from loss of blood may quite easily be mistaken for a case of splenic anemia.

The recent success of splenectomy in severe cases of purpura hemorrhagica is known to all of us, and there seems to be no question that remarkable results have been obtained. It will be a difficult matter to know just when to advise splenectomy. Frequent transfusions are curative in certain mild types of purpura hemorrhagica, but on the other hand, one cannot predict that the case will not prove to be a severe or even a fatal one. The differential diagnosis between purpura hemorrhagica, hemophilia and aplastic anemia is especially important in this connection.

THE ANTINARCOTIC LAW AND CODEIN

A committee appointed by the Ohio State Medical Association to study the habit-forming properties of codein, with a view to determining the need for changing existing law, has submitted to the Council of that Association certain data collected by the committee. A questionnaire was sent to 100 general practitioners and to 125 physicians engaged in special branches of practice.

Of the fifty-seven general practitioners who replied, forty-eight did not regard codein as a habit-forming drug, and nine were unable to express an opinion. Seven reported that in cases of codein addiction the habit was easily broken. Ten regarded it as inconsistent with public interest to exempt codein sulphate from the operation of the Harrison Narcotic Law, thirty-nine wrote that it might be so exempted, and eight were of the opinion while it might be exempted, yet it should in its sale be limited to sales on physicians' prescriptions.

Fifty-eight physicians practicing special branches of med-

icine replied. Of these forty-nine did not regard codein sulphate as a habit-forming drug, six thought that it would tend to form a habit, and three were unwilling to express an opinion. Eight reported that the codein habit was easily broken, but two were of a contrary opinion. To the inquiry as to whether it is consistent with public interest to exempt codein from the operation of the Harrison Narcotic Law, twelve replied in the negative and thirty-nine in the affirmative. Three, however, would have codein dispensed only on physicians' prescriptions.

In the answers to these questionnaires it was suggested that the infrequency with which codein addicts now appear might be attributable not to the fact that it does not possess habit-forming properties, but to the fact that it is as easy to get heroin, morphin and cocain as it is to get codein, and that if any change were made in the law that would make it easier to obtain codein than to obtain the other drugs, codein addiction might become more common.—A. M. A. Bulletin, Nov., 1923.

RETROPERITONEAL TUMOR*

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There are many organs and tissues occupying the retroperitoneal space, each of which is subject to a variety of tumors. The kidney, suprarenal glands, pancreas, parts of the bowel, the mesentery, etc., may each be the site of development of new growth and therefore of a retroperitoneal tumor and, broadly speaking, the title of the present discussion would include all these growths. This, however, would make the term include such numerous and widely diversified tumors that for practical convenience it is commonly applied to the primary tumors arising from the connective tissue of the retroperitoneal space, either lipomas or sarcomas in their various combinations and modifications. Even in this narrowed sense a comprehensive review of the literature and of all the surgical bearings of the condition would require a much more extended discussion than is permissible for the present occasion.

To bring the subject concretely before the society two cases are reported.

CASE 1. Female, aged 42. Well as a child, menses regular and normal. Has one child aged 5 years, instrumental delivery. Tonsillectomy 1920.

Present complaint: Pain in right hip; unable to walk on account of pain.

History: Had attack of pain in hip in 1918—duration one week, followed by complete relief until January, 1919. Then, without apparent cause, began again to have pain in right hip. Pain was worse when walking. In April, 1919, she noticed a small mass just above the right sacro-iliac joint; it was not painful, but there was a very tender point just below the mass. The tumor slowly increased in size. There is no edema of the right lower limb, but it feels as though asleep at times, and seems colder than the left. Patient has occasional headache. No history of urinary disturbance. No nausea or vomiting. Bowels constipated. The pain is more severe at night and is occasionally transmitted to the knee.

Examination: A tumor is palpable in the right gluteal muscle half the size of the palm of the hand; tense, not tender to touch. Vaginal examination reveals a solid immovable tumor the size of a lemon to the right of the uterus over the sacro-iliac region.

Operation Nov. 14, 1920: Exploratory incision over tumor in right gluteal region. On going through the deep fascia and into the muscle an encapsulated soft tumor of the consistency and appearance of thyroid tissue was encountered. There were several prolongations of the tumor

which could be readily shelled out except at the base where they sprang from the vicinity of the sacro-sciatic notch. These masses were removed as far as possible and 50 mgm. of radium was placed against the base of the tumor. Pathological diagnosis—fibro-myxo-sarcoma of very low grade malignancy.

Operation Dec. 10, 1920, on diagnosis of retroperitoneal sarcoma in the right pelvis. Median abdominal incision. A tumor was found behind the peritoneum in the true pelvis, extending downward about 3 inches from the iliopectineal line. The posterior parietal peritoneum was incised at the inner side of the internal iliac artery. The ureter and iliac vessels could be seen lying on the surface of the tumor. The tumor was encapsulated and was enucleated without difficulty. At the sacro-sciatic notch it passed out of the pelvis and from this point its extension followed intermuscular planes in the gluteal region. The bone at the sacro-sciatic notch was softened by pressure of the tumor. The patient is still living, but she has had a great deal of pain and a discharging sinus, and a recent report indicates that her condition is unsatisfactory.

CASE 2.—Female, aged 45. Had a miscarriage fourteen years ago, menses irregular. One child living and well, aged 11. Bowels somewhat constipated. No history of previous serious illness. About eighteen months ago she first noticed a swelling in the right abdomen accompanied by a sensation of weight and a "beating sensation." She had no pain in the abdomen, but the fact that there was something present in her side made her very nervous. There were no symptoms of bladder or kidney trouble. Has backache and pain through shoulders and up into her neck. Has smothering sensation when lying down. During the past three months the tumor has grown rapidly and the pain in the back and shoulders has been more severe. She consulted a surgeon several months ago who made a diagnosis of tumor of right kidney and advised an operation.

Examination reveals an extensive nodular, solid, but not hard, tumor occupying the entire lower abdomen, making it about the size of an eight months pregnancy. There is some fluctuation in the lower abdomen when the patient stands—probably free peritoneal fluid. There is dullness on percussion over the entire abdomen except in left flank and over the stomach. The course of the colon cannot be followed. Vaginal examination is inconclusive; the pelvic organs cannot be identified. The tumor was thought to be a multi-locular ovarian cyst.

Operation Jan. 16, 1923: On opening the abdomen an enormous tumor entirely filling the abdominal cavity was encountered. Abdominal viscera were nowhere in sight. The peritoneum covering the tumor was a very thin vascular veil loosely connected to the underlying layer which proved to be the capsule of the tumor and which contained numerous large blood vessels. The uterus, tubes and ovaries were normal. The cecum and ascending colon could not be seen. What appeared to be descending colon was closely attached to the left side of the tumor but could be easily separated from it. The left kidney felt normal. The right kidney was behind the tumor and could not be identified. The transverse colon was attached along the upper border of the tumor. Small bowel was not seen and

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the mesentery could not be identified. The capsule of the tumor was incised and a line of cleavage found between the tumor and its capsule, but in attempting to follow this line free venous bleeding resulted. Exploration for two inches into the substance of the tumor revealed, so far as we went, a pure lipoma. The anatomical relationships are reported as they appeared and were interpreted at the operation, but the true condition will be revealed by the necropsy report. The removal of the tumor was regarded as involving insurmountable difficulties and risks and was not attempted. A few weeks later two tumors appeared in the pericranium. One of these was removed, and microscopical examination showed it to be a spindle-cell sarcoma growing rapidly. Ptosis of one eyelid developed, and physical signs of involvement of the pleurae. Death occurred about eighteen months after patient first noticed the tumor.

Autopsy is limited to the abdomen. The subcutaneous fat is very scant. Presenting in the incision is a large yellowish tumor. It is apparently everywhere covered with peritoneum except on the posterior surface. The tumor fills the right flank, is in contact with the inferior surface of the liver and below with the brim of the pelvis. It extends across the mid-line and has pushed the cecum and ascending colon over into the left flank. Attempt to strip the peritoneum from the tumor is only partially successful for in some areas it cannot be separated. The small bowel has all been crowded far into the left abdomen and is entirely covered until the tumor is raised out of the abdomen.

When removed the tumor weighed 5,075 gm. including the right kidney. It shows a deep depression corresponding to the spinal column. The right kidney has been carried to the left of the spinal column and rotated on its long axis, so that the pelvis of the kidney looks toward the right side. It is almost completely imbedded in the tumor and the ureter lies within the tumor almost down to the brim of the pelvis. The kidney has not been invaded by the tumor, and its capsule can be readily stripped off. The right adrenal lies on the posterior surface of the tumor. The left kidney is apparently normal. There is moderate dilatation of both kidney pelves and of both ureters. The spleen shows no gross lesion. The liver is about normal in size but there is a deep depression in the right lobe due to pressure atrophy. There are no tumors in the liver. There are numerous hard nodules scattered over the parietal and visceral pleurae of both sides of the chest. These nodules extend for only a short distance into the parenchyma of the lung. In the posterior mediastinum is a tumor about 5 cm. in diameter which bulges into both pleural cavities. The abdominal tumor had not dissected between the leaves of the mesentery of the small bowel, but the transverse mesocolon had disappeared and the colon throughout lay in close contact with the tumor. The aorta and vena cava lay behind the tumor but closely covered by it, and the mesenteric arteries passed for a considerable distance through the tumor and between its lobules. There is no edema of the lower extremities. The tumor mass is lobulated. On section it has a variegated appearance. In some parts there are masses 4 to 5 cm. in diameter which are apparently normal adipose tissue.

In other parts there are firm grayish-white translucent masses. Other similar areas have a yellowish color. In the center of the tumor is a large mass of necrotic tissue. Microscopically various parts of the tumor show various histological structure. In some areas it is composed of normal adult adipose tissue, in some of fatty tissue of embryonal type. Some parts of it show the structure of spindle cell sarcoma, some of fibro-sarcoma, and in others the structure is that of a myxoma.

The occurrence of two cases within three years in a comparatively small surgical practice indicates that the condition is not so rare as it is commonly supposed to be. On the other hand it is sufficiently infrequent to justify calling attention to this coincidence as an example of a fact often observed that one unusual case is often followed in a short time by another one of similar nature. These two cases are reported not with the hope of presenting any new facts, but of reiterating some that are old, and of calling attention to a condition which is apt to be overlooked. Moreover, a study and comparison of the writings upon this subject, instead of clarifying it, in some respects make it more obscure, and it is almost impossible to compare the statistics and collected cases of various authors, because no two use the same classification and in a collection of reports of cases of retroperitoneal lipomas will be found a considerable proportion of myxomas and sarcomas. The title of this report was therefore chosen advisedly, for it is a question whether even the so-called pure lipomas, in view of their behavior and their pathological relationships, should not be put into a different class from lipomas in other regions of the body; until their exact status is determined, the term retroperitoneal tumor will be sufficiently explicit, for, for practical purposes, it may be usually considered as synonymous with retroperitoneal sarcoma. The literature on this condition is comparatively recent, but is quite extensive considering the small number of cases reported. Virchow, although he mentions the form of fatty hyperplasia which is frequently seen around the kidney in cases of hydronephrosis, renal calculus and other chronic forms of renal disturbance, makes no mention of the definite fatty tumors which are occasionally found in that region. Adami in 1896 was unable to find any general article on the subject of retroperitoneal lipoma in the English language, and after an exhaustive study of the literature was able to collect reports of only 40 cases, to which he added two of his own. Wahlfendorf¹ in 1921 collected reports of 165 cases

of lipoma and reports on Adami's cases are included in this series. The latest case report is by Greensfelder and Bettman.² On the subject of retroperitoneal sarcoma the articles by Steele³ in 1900 and 1904 are classical. He collected a total of 96 cases. In April, 1923, Andrews⁴ collected the cases in the literature since Steele's report and added 28 cases from the Mayo Clinic, making a total of 142 cases. The two cases reported herewith bring the number of retroperitoneal sarcoma reported up to 144. At this point attention is again drawn to the uncertain classification of these growths. The articles by Adami and Wahleldorf are under the titles of Retroperitoneal Lipoma. In one of the two original cases reported by Adami he found that "in one region * * * an oat-shaped cell growth replaced well formed connective tissue, so that sections from this area presented a markedly sarcomatous appearance"; and in the other "the tumor was found to consist largely of adipose tissue in a voluminous stroma of embryonic connective tissue with abundant nuclei between the fat cells." Of 151 cases tabulated as retroperitoneal lipoma by Wahleldorf, 82 were classified as mixed tumors, 20 presented sarcomatous changes and in 15 there were recurrences after operation, indicating strong tendency toward malignancy in these tumors. It is probable that these published statistics do not correctly indicate the true number of retroperitoneal tumors, and a remark by Hertzler may be à propos: "Few men take any great pleasure in reporting a case in which the diagnosis was wrong and the treatment a failure."

The etiology of these tumors is unknown; hence there has been a great deal of speculation and many theories have been advanced to explain them. The occurrence of lipoma is not related to general corpulency, but on the contrary many of its victims are below average weight and the tumor even when it is apparently a pure lipoma seems to grow at the expense of the normal fatty tissue of the individual. Pregnancy has been regarded as an explanation of the greater frequency of lipomas in women than in men, but no acceptable explanation is given as to how it operates. Mechanical irritation has been suggested, due to the movements of the hollow organs and the pulling on the tissues by their alternate filling and emptying. Nutritional conditions, abuse of alcohol with rapid increase in body weight seem to be a factor in some cases.

The lymph glands are undoubtedly the point of origin in many retroperitoneal sarcomas, and Askanazy regarded it as possible that lipoma might also spring from them through some process of fatty degeneration. Inflammatory processes are a factor in some cases. Kornmann found inflammatory changes in kidneys, spleen and liver and concluded that the condition in some cases at least is not a tumor of pure type but is related to inflammatory processes in other organs as well. Finally these tumors, both lipoma and sarcoma, may arise as tumors of the embryonic mesenchymal layer, and this seems to be the most plausible explanation of their presence.

Retroperitoneal tumor is more frequent in women than in men, 72 per cent of patients in Wahleldorf's collected cases of lipomata being women. Among the cases reported as sarcoma, however, the incidence in the two sexes is about the same. A few cases have been reported in children and in one instance a child of one year had a tumor of the pararenal fat that was of prenatal origin. Nearly 90 per cent of Wahleldorf's cases occurred between ages of twenty and sixty. The origin of the tumor is in the abdomen in about 80 per cent; in the pelvis in 20 per cent. Of the abdominal tumors, 72 per cent are lateral; 28 per cent median. They originated from the kidney capsule in 23 per cent; from the pararenal and lumbar fat in 35 per cent, and from the mesentery in 20 per cent. Among the occasional sites in which tumors have been reported may be mentioned the gastro-hepatic omentum, in which Peyrot found a lipoma undergoing myxomatous and sarcomatous changes. Alsborg described a tumor of the transverse mesocolon. Two cases have been reported of tumor of the mesentery of the small bowel; a few cases of lipoma of the broad ligament. Chiari reported one case of symmetrical lipomas developing beneath both ureters. The pathology of these tumors is confused by the fact that they originate in a region where there is a great variety of structures and which is also a frequent site for teratoma.

In tumors classified as lipomas are frequently found areas of myxoid tissue, which is a primitive tissue closely related to and often associated with sarcoma. Even tumors which are apparently pure lipomas frequently recur after surgical removal and thus suggest a tendency to malignancy and raise the doubt whether they are in fact pure lipomas or should not rather be classified as mixed

tumors. The same observation applies also to the other connective tissue tumors of this region, which are seldom of pure type. It is, indeed, a well recognized fact that any one of the group of connective tissue tumors may show areas undergoing conversion into other members of the group. The reported cases show that in these large tumors we may have examples of practically every form of connective tissue from fibrous to adipose and in all possible combinations and admixtures with myxoid, cartilaginous and even bony tissue and that they have a strong tendency to reversion to embryonal type. Hertzler, indeed, favors the view that these tumors, even the pure lipomas, are to be regarded as embryonal in origin and not merely a reversion of an adult tissue to the embryonal type. This view is supported by the fact that in some cases the tumor is known to have begun in childhood and by the further fact that the most frequent location in all the cases reported is the region of the kidney, which is a frequent site for teratoma and tumors of embryonal origin.

From a practical standpoint, it is important to emphasize the fact that all these tumors exhibit malignancy in one way or another, either by reason of their inherent nature or on account of their widespread extensions around important structures, which extensions are ultimately fatal if permitted to remain and at the same time in many cases cannot be successfully removed by operation. The pure lipomas in this region, therefore, should be regarded differently than we regard tumors of the same structure in other localities. The name lipoma arouses in the mind of the surgeon a feeling of confidence and of mastery of the situation which is likely to be severely shaken when he encounters a lipoma of the retroperitoneal space.

Symptoms are remarkable for their absence until the tumor has reached large size. Pain is very infrequent. There is usually no disturbance of the gastro-intestinal or urinary functions. The most remarkable effect of the tumor is loss of weight of the patient. The tumor seems to develop at the expense of the patient's fat and there is usually great emaciation, but without the characteristic appearance of cachexia. When the tumor has become very large symptoms attributable to pressure will develop, such as constipation, interference with respiration, disturbance of urinary function, edema of legs, scrotum or vulva, and ascites.

The correct diagnosis is seldom made before

operation. It seems probable that Greensfelder² has pointed out the explanation for this failure in many instances to recognize the character of the tumor. He says in reporting a case, "We confess that the condition of retroperitoneal lipoma did not enter our minds." Encouraged by his example, the present writer is constrained to make the same confession. On account of the soft consistency of the tumor which gives a sensation as of fluctuation, the diagnosis of ovarian cyst has been made most frequently. The emaciation without cachexia produced, in the second case in this report, a very good example of the facies ovariana. The error in that case could have been avoided by closer attention to the history and by x-ray examination of the ureters, kidneys and colon. These would have shown the dislocations of the right kidney and ureter and of the ascending and transverse colon, producing distorted relationships which could have been caused only by a growth behind the peritoneum and not by any possibility by a tumor within the peritoneal cavity. Of prime importance in the diagnosis is the relationship of the hollow viscera, and especially of the large bowel, to the tumor. The transverse colon crosses the summit of the tumor and the ascending or descending colon, depending on the side on which the tumor originates, is displaced toward the median line or the opposite side. This relationship when demonstrated will exclude tumors of the ovary, uterus, omentum, liver and spleen. A mesenteric cyst is at first lateral, then, becoming larger, is central and points toward the umbilicus. It is freely movable, especially transversely, and rotates upon its axis. It is surrounded by a zone of tympany and has a zone of tympany passing over it. (Steele.) Solid tumors of the mesentery are very movable, but otherwise very closely resemble retroperitoneal tumors. It should be possible, in most cases, to say whether the tumor is behind the peritoneum or within the peritoneal cavity, but of course the physical signs are not characteristic of retroperitoneal tumors alone (using the term in its restricted sense) but are found in any tumor arising in the retroperitoneal space and would therefore apply also to tumors of the kidney, the adrenal, remains of Wolffian ducts, pancreatic cysts, aneurism of the aorta, etc. A full discussion of the differential diagnosis is to be found in the papers by Steele.³

The treatment is surgical, for even those tumors which are histologically benign are always fatal,

unless they can be removed. The only exception to this rule is the solid non-malignant myo-fibroma or osteochondroma, which is extremely rare and may be recognized by the history, course and character of the growth. Retroperitoneal tumors in the pelvis present less formidable surgical difficulties than those in the upper abdomen because the anatomical relations are less complicated. In the first case reported here, the ureter and iliac vessels were easily seen lying upon the surface of the tumor. In the upper abdomen, however, the difficulties are much greater. I will beg the indulgence of the society in discussing a subject so elementary as anatomy, but the problems presented in operating on these tumors are largely anatomical. Retroperitoneal tumors are expansile in their growth and dissect along fascial planes and therefore the consideration of the fasciae of this region is of utmost importance. At the outer border of the kidney the fascia underlying the parietal peritoneum divides into two layers, one passing in front of and one behind the kidney. The name of Gerota, who described it in 1895, has become attached to this perirenal fascia. After thus splitting, the posterior layer, or retrorenal fascia, passes inward immediately in front of the lumbar muscles, and at the inner border of the psoas muscle it blends with the fascia covering the bodies of the vertebrae and intervertebral discs. It therefore lies behind the perirenal fat, the suprarenal gland, the renal arteries and veins and the aorta and vena cava. Above the level of the kidney it reunites with the anterior layer and becomes lost in the diaphragm. Extending downward both layers lie close together but do not actually fuse, and, becoming thinner and thinner, are lost in the loose areolar tissue of the iliac fossa.

The anterior layer or prerenal fascia lies beneath the peritoneum, to which it is loosely attached by a delicate areolar tissue. This attachment is so loose that in operating on one of these tumors it is easy to be deceived into thinking, after cutting through the peritoneum and seeing the smooth structure beneath, that another serous membrane has been encountered. This prerenal fascia forms the anterior capsule of the perirenal fat, and therefore bears that same relation to the tumors arising in that space. It passes inward in front of the renal vessels, aorta and vena cava and becomes continuous with the corresponding layer from the opposite side. It lies behind the colon (ascending and

descending) and behind the duodenum and pancreas. Where the peritoneum passes in front of viscera (e. g. duodenum or colon), it becomes separated from the prerenal fascia which lies behind these organs. The fascia passes behind the root of the mesentery and of the transverse mesocolon, thus shutting them off from the perirenal space. The superior and inferior mesenteric arteries, therefore, are outside the perirenal space except for the short distance between their points of origin in the aorta and the point where they enter the mesentery. The ureter throughout its course is within the perirenal space and is attached to the under side of the prerenal fascia. This attachment is quite firm and it is probable that in most cases this relationship would be maintained. It should be borne in mind, however, that in its upper course after it leaves the kidney the ureter must necessarily traverse the perirenal space for some distance. When ureter, veins or arteries pass through the tumor, they will always be found in the planes between the lobules of the tumor.

It is evident, therefore, that the prerenal fascia is a most important guide to follow, and fortunately, in a case of tumor behind it, the fascia tends to become thicker than normal and more easily followed. It can be safely incised at the outer side of the colon, thus giving entrance to the perirenal space, and so long as the surgeon is working within this space the dangers will be limited to certain areas, that is, in the mid-line where the mesenteric vessels leave the aorta, and in the region of the hilus of the kidney. A more detailed description of the anatomy and of the technique of operation is to be found in the article by Reynolds and Wadsworth, *Annals of Surgery*, 1906, vol. xlv.

Andrews (*loc. cit.*) reports favorable results in several cases of sarcoma from treatment by combined x-rays and radium, and states that in some instances the mass has entirely disappeared. He suggests this form of treatment as an aid to diagnosis where sarcoma is suspected.

The prognosis obviously depends upon the size and nature of the tumor. As has been already stated, it is uniformly fatal unless it can be removed. The mortality from operation is about 15 per cent and appears to be about as high for lipoma as for sarcoma. The anatomical relationships and fascial coverings of the tumor render its removal comparatively easy and safe while it is still small, or even if it is of considerable size if it has not

crossed the mid-line and therefore involved the mesenteric vessels, aorta and vena cava. It may be necessary to remove one kidney with the tumor and it is essential, therefore, always to determine the presence and functional capacity of the other.

Here, as in so many other conditions, successful treatment depends upon early diagnosis. Twenty-one of the series of 28 cases reported from the Mayo Clinic were found to be inoperable. These tumors are peculiarly insidious in their growth and the patient is lulled into a false sense of security because his tumor produces so few symptoms, and by the time it begins to cause symptoms it has become so large that removal is impossible.

Finally, as influencing the ultimate prognosis is the fact that many, if not all these tumors, lipomas included, are in reality mixed tumors. Among the 113 operated cases in Wahleldorf's series recurrence was noted in 15, and of these 15 five were lipomas, three fibro-lipomas, three fibro-myxolipomas, thus indicating that our usual distinctions between so-called benign and malignant tumors do not strictly apply to retroperitoneal tumors, for recurrence in lipoma and fibroma is contrary to our conception of the nature of these tumors.

The danger which is inherent in a tumor because of its malignant nature cannot be escaped; but the potency for harm which it acquires during months or years of insidious growth can be prevented by correct diagnosis which will point the way to earlier treatment.

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DISCUSSION

DR. O. W. YOERC: When Dr. Baxter kindly asked me to lead the discussion of his paper, I asked him why he had chosen me, who had had so little experience along something of that nature. On looking up the literature I found that very little had been written, and the cases were few, as he has already stated. In speaking of sarcomas developed retroperitoneally, developed primarily from the peri-

toneal connective tissue, you impose a limitation that makes the group small. Most of these cases, from what I could gather, are lymphosarcomas or mycosis sarcomas. The lymphosarcomas seem to predominate and that is probably because you have the retroperitoneal lymph-glands and the lymph-glands in the mesentery, and that would probably also hold true of the mediastinal sarcomas, which are usually of lymphatic type.

As stated, the sarcomas as true types are hard to diagnose. They begin insidiously, without any pain, and by the time they demonstrate any symptoms there is a large tumor covering a considerable space. Lipomas, from what I could gather from the literature, will sometimes reach the weight of 20 to 50 pounds, and are usually not of the pure lipomatous type. The sarcomas when they do develop to that stage where a diagnosis is made—usually on exploratory incision—have reached a size so that they can hardly be removed. If they can be found early while still encapsuled, before metastasis develops, the chance of getting them out efficiently is better. But after they have become so large, the vascularity of the tumor and the proximity of the tumor to the larger vessels and the danger of hemorrhage, and also in removing them the danger of opening up avenues of metastasis and not being able to get all the tumor—due to all this, they are sometimes left in worse condition than if they had not been operated on.

It occurs to me that these tumors could probably be attacked more readily with the deep x-ray. We are now using it at Northwestern Hospital. We have had a deep x-ray machine there for the past year and a half, and the men there have had some very good results with sarcomas, kidney sarcomas and mediastinal sarcomas, with x-ray pictures showing large involvement. By treating them from different positions, the x-ray pictures—say of the chest—would be entirely negative afterwards. In these cases it would probably be to better advantage to the patient and to everybody else concerned if the diagnosis could be made and then treated with the deep x-ray therapy. The end results would probably be just as good. The end results either way are not good, but the patient would be alleviated of a lot of suffering and probably would get along better, because there is a certain element of danger in operating these cases. The mortality is fairly high in the line of tumors. I think that covers my meager knowledge of the subject.

DR. S. R. MAXEINER: I would just like to mention pneumoperitoneum as a diagnostic point in these retroperitoneal sarcomas. With the pneumoperitoneum and the patient lying on the face, with a large pillow or block or sandbag under the chest and under the pubes, a lateral picture should show an area filled with gas immediately in front of the spine. With the presence of a dense tumor this area is obliterated, and with the history and physical findings confirmed by the obliteration of this space in a pneumoperitoneum, some of these cases I think can be diagnosed and subjected to their x-ray treatment without the necessity of exploration for a specimen.

DR. R. E. FARR: I just want to accentuate the points made by Dr. Maxeiner regarding the employment of pneumoperitoneum in these cases. Dr. Santy showed a number of years ago the importance of this method in

differentiating retroperitoneal tumors. Another point I might mention is the comparative ease with which low-lying retroperitoneal tumors may be diagnosed by introducing the finger into the rectum.

DR. H. B. SWEETSER: I don't remember offhand having seen one of these tumors posterior to the peritoneum. Of course, we see a good many metastatic tumors that involve the glands, and I know that there is great difficulty in dissecting them out, and you never get them all out. If they can be subjected to the x-ray with any chance of success at all, I think that would be the preferable method.

DR. A. S. FLEMING (speaking by invitation): Not being a member of the Society, I was reluctant to take part in the discussion, but when Dr. Sweetser said that he had nothing to say on the matter it reminded me of the fact that I had seen a case that I suspected of being a retroperitoneal tumor, sarcomatous in type, in consultation with him some time ago. That also brings to mind the fact that in the last ten years, while associated with Hillcrest, I think I have had an opportunity to see, aside from the two cases that Dr. Baxter has brought up for consideration, three others, making a total of probably five of these retroperitoneal tumors, sarcomatous in type. Strange to say, one of these cases is alive after five years, and apparently better now than she has been for many years.

The problem of diagnosis depends a good deal on the point of origin, whether it is in the upper retroperitoneal space or in the lower lumbo-sacral region. This case in which the original diagnosis was made of an enlarged kidney, and later on suspected ovarian tumor, I had an opportunity to examine. Naturally anatomically it should have done just what it did; it stayed up there and displaced the viscera, pushed them out of the way, over to the left. It first presented itself as a large kidney, and then as it occupied the whole space and produced emaciation, it produced a typical picture of a large ovarian cyst. That was one of the later cases.

The other cases were tumors, originating in the lower portion of the retroperitoneal space, and presented surface signs appearing very much like tubercular abscesses will after they have followed the fascial planes either down into the pelvis, appearing in the groin, or through the sacro-sciatic notch. The case of Dr. Sweetser was of a young boy who had come here from Iowa and reported with a tumor appearing on the buttocks. He dissected down and I think followed that tumor as far as the sacro-sciatic notch. I had an opportunity to apply some radium in the pocket, but we could not accomplish more than temporary relief.

The first case of the kind that I recall appeared as a tumor thought to be a tuberculous abscess in the groin. Incision was made into the fluctuating mass, but instead of pus organized tissue was found, that on examination appeared to be sarcomatous. In that case we did not attempt to remove the different extensions of that growth because it went down into the pelvis, and it was very difficult to get access to. We were simply satisfied with applying radium as far as we could follow it. Unfortunately I lost track of that case, after following it for about six months.

The case that is now alive has a very remarkable history. She first reported to the hospital and an exploratory laparotomy was performed, a large retroperitoneal tumor impossible of removal was found. She went home and later returned for some relief from pressure symptoms. It then had made its appearance at the crest of the ilium. Then an incision was made and radium implanted in the tumor. She also received deep x-ray and responded very well. After several radiations she developed a sinus leading into the tumor that continued to discharge for a long time and it looked as though there was absolutely nothing further to do. She seemed to get radium fast and x-ray fast. About the time we decided she ought to engage an undertaker, she seemed to get better, and she has remained better ever since. That is a little over two years ago.

Another case was of a little girl who reported in her seventh year with a tumor appearing at the buttocks and loin with some flexion of the thigh. That responded to radium for over a year, then became radium fast and failed to respond, and the child died. The peculiar thing about this was that the little girl and the woman both came from the same neighborhood. So they don't seem to be as uncommon as one would be apt to think.

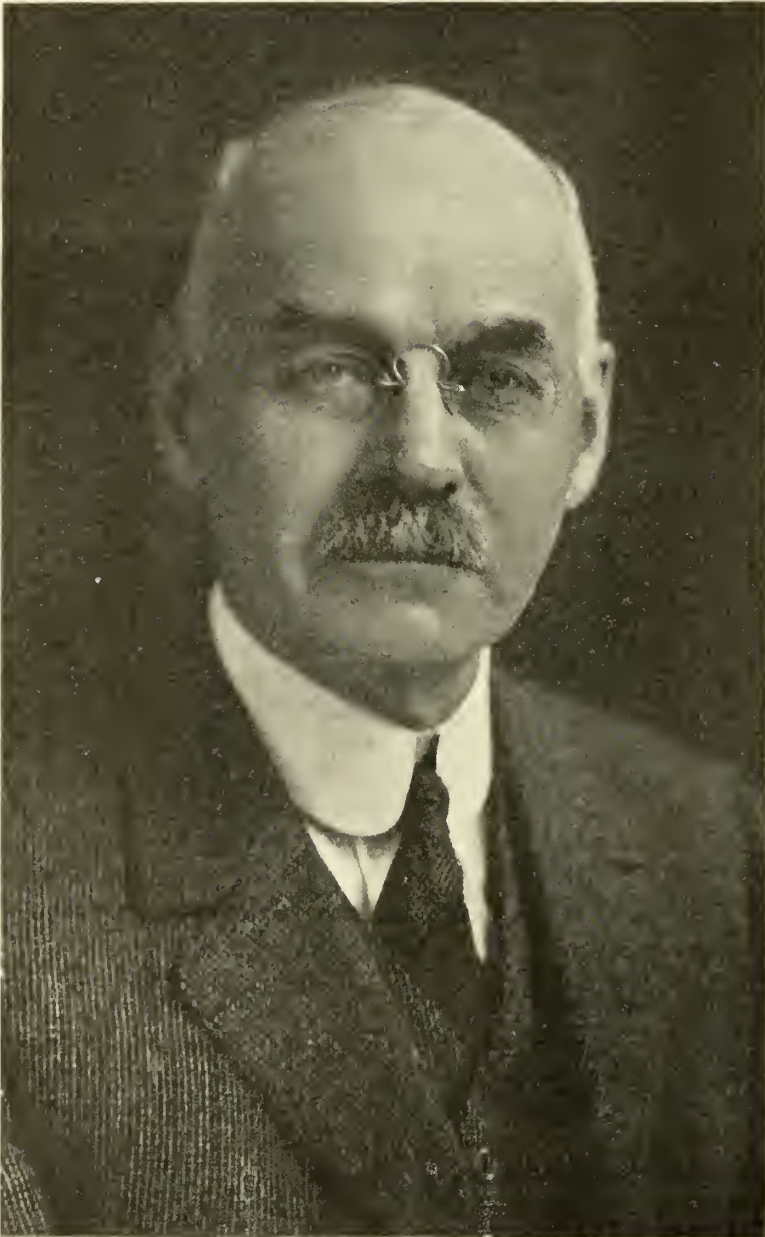
DR. A. W. ABBOTT: I want to call attention to one other condition; I didn't notice Doctor Baxter mention it, but I think he will recognize it because I think he helped me with at least one such case. That was a distended, or rather a misplaced, hydronephrotic kidney which was just above the pelvis. That brings in again the importance of using the usual catheter or pyelogram to make the diagnosis.

I think the Society is to be congratulated on having a paper like this; it is a real classic on this subject.

DR. S. H. BAXTER: In the matter of treatment, I did not go into the x-ray treatment very extensively, but these tumors when they are sarcomatous have in some instances eventually responded to deep x-ray therapy. Andrews in his report on the series from the Mayo Clinic has even gone so far as to suggest the use of x-rays in cases of undetermined tumors as a diagnostic measure, evidently in the same way that we used to use potassium iodide as a therapeutic test for the purpose of determining the nature of some obscure infections.

I think that ordinarily our usual means of physical examinations will enable us to make a diagnosis of a retroperitoneal tumor if only we have it in mind; but in a good many of the cases reported, the condition has not even been considered and that has been one of the reasons why I wanted to present this case because it is rather unusual and at the same time it may not be so unusual as we ordinarily think it is. If we have it in mind and exercise the ordinary means of diagnosis I think most of them can be diagnosed. However, Dr. Maxeiner's suggestion is useful in case the usual means fail and we are forced to resort to the extraordinary means for diagnosis.

The diagnosis is the main thing, because, as I stated in the paper, these tumors are uniformly fatal, regardless of their histological structure; even those that are so-called pure lipomas are always fatal unless they can be removed. So an early diagnosis is a matter of very great importance.



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President of the Minnesota State Medical Association, 1924

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EDITORIAL

The Proposed New Minneapolis General Hospital

A medical school depends in large measure on available clinical material. The University medical school, not having a large hospital, has utilized half the patients in the Minneapolis and St. Paul City Hospitals for some years past and is likely to pursue the same practice for years to come. Both of these city hospitals are inconveniently located for undergraduate work and with the contemplation of a much needed new Minneapolis general hospital the proposition of locating the new structure near the University campus has been brought forward. This is a matter of interest and importance to the medical men of the state and the medical school itself and should be viewed from an impartial standpoint.

The present Minneapolis General Hospital in the congested downtown district of Minneapolis is too small for the growing city. Like many such insti-

tutions, it is the complex and inconvenient result of combining buildings of various ages, constructed without any original far-reaching plan. It is confined to one small block of land and is in a rather smoky and dirty section. The Superintendent and Board of Welfare are certainly correct in their decision that something must be done soon to provide new buildings on a new site.

But where should such a hospital be placed? Its primary function is the care of the poor of the city. For this purpose it should have good physical surroundings; but above all it should have the best staff and nursing service that can be provided. Doubtless, like all the great charity hospitals, it will be dependent on a voluntary staff. It should be placed where it can be reached easily by the busy men of the medical profession. This shuts out distant suburban proposals. The river bank near the Medical School is beautiful and accessible.

A second important function of the hospital is medical and nursing education. By arrangement with the city the University nominates half the staff. Twelve medical students live at the hospital all the time and serve as junior interns. Required clinics, elective clinics, clerkship and extern work of great educational value are carried on there for both Juniors and Seniors of the Medical School. The Pathological Department of the school conducts a weekly pathological conference at the hospital which is of value alike to the staff of the hospital, to the University and to visiting doctors. The interests of undergraduate medical teaching (and this means the broader interests of health and medical service in the city and state) dictate that the new hospital be located as near the Medical School as possible.

The nursing school of the General Hospital is part of the University Nursing School. The pupil nurses get their first quarter's instruction at the Medical School. After that they get practical instruction at the Hospital but go to the University for certain classes. This important work is hampered by distance and would be much facilitated by a location on the campus or across the street from it.

Graduate medical teaching presents the same problem and the same plea. When doctors come to the city to see clinics and take "refresher" lectures their time should be saved. For work toward advanced degrees in clinical specialties

under the Minnesota plan, proximity of clinics and laboratories would spell opportunity and call excellent students. The effect on the staff of the hospital would be good. The University offers to place at the disposal of the hospital its laboratories, library and scientific investigators.

It is not proposed that the location of the hospital near the University would in any way affect its management or policy. The city would control it in every way as it does now. The reflex advantages of co-operation would be mutual. But both the University and the Hospital would retain entire autonomy and independence. This, of course, is legally necessary.

The Board of Welfare has signified its willingness to accept a site near the University. The proposition has met the approval of the Medical Alumni Advisory Board. The University has considered offering a site on the campus. This could only be done with the approval of the State Legislature. The second proposal is that the University through gifts provide other land near the campus on which the hospital may be built. The latter is, perhaps, the better plan and will probably be adopted.

There can be no doubt that this proposition is the most important one in its bearing on medical education that has arisen in Minnesota in many years. If it is settled wrong and the General Hospital is placed at a distance, the mistake can never be rectified. If it is settled right and the immediately needed 600 or 800 beds, followed as the city grows by larger numbers, are placed close to our already excellent medical school, a permanent forward step will be taken, a step toward that coveted goal of making the Twin Cities one of the great medical centers of the country.

Facts and Refraction

A recent article from the pen of our friend, Dr. Brady, concerning the use of cycloplegics in refraction precipitated a spirited controversy in the columns of one of the St. Paul daily papers between two local opticians.

Dr. Brady had mentioned the necessity of using "drops" to refract properly most individuals under forty years of age. This article brought out quite a strenuous opposition from an optician who has

been warning the public in his advertisements for some time past of the danger of "drops" and their uselessness, quoting many alleged utterances of authorities to that effect. A reply was published from a second optician, denying the existence of such danger when "drops" are used under the guidance of qualified and competent oculists, insisting on the necessity of using "drops" in selected cases of latent errors, ciliary cramp, etc., and also stating that in his opinion only the law prevented most opticians themselves from using "drops" in refraction. He also dwelt on the advantage of a fundus examination by men medically trained in the recognition of diseases of the eye.

When medical facts are thus distorted and advertised to the public, it is incumbent upon someone to take up the cudgel. In this instance the unpleasant task was spared the medical profession by the reply of the second optician, who by the way limits himself exclusively to filling prescriptions. Here is one instance where the temptation to distort facts in order to do more business was too much for one optician. The desire to sell a pair of glasses on the part of many an optician doubtless inflicts glasses unnecessarily upon many a child who has a slight refractive error. Human nature is so frail that it is well to divorce the two sciences.

The fact of the matter is that most opticians do not concur in the opinion voiced by their confrere regarding the undesirability of a cycloplegic in refraction. At least one optometrist in this section has employed a "Doc" to "stick around" for the purpose of using drops in the eyes of his clients, the distinct advantage of which he advertised in the papers.

Refraction affords numerous opportunities to detect the presence of eye pathology. The eye is not simply a mechanical lens and screen. Take it all in all, the individual ignorant of the diseases of the eye cannot render as great a service as one on the outlook for evidences of local or constitutional diseases expressed in the eye.

No part of a medical examination is so certainly worth while, when indicated, as a fundus examination. Every refraction in the hands of a competent oculist includes this. It is not too much to say that in refraction, more often evidence of unsuspected local and constitutional disease is found than in any other kind of a medical examination.

St. Paul Clinic Week

The dry clinic more than the wet is to be the outstanding change in the program as arranged for St. Paul Clinic Week this year. Clinics and symposia have proven themselves of most value in medical programs and clinics will occupy each morning with a symposium each afternoon. Following the symposia, opportunity will be afforded visitors of hearing outside speakers of national prominence.

A glance at the program which appears elsewhere in this issue will convince one that the selection of subjects has been a happy one. The morning clinics, although fewer this year, are not being published in the journal but will be posted daily at headquarters.

The average physician is a busy man. He cannot take an extended postgraduate course, but he can derive a lot of practical information from clinical meetings of this sort.

Dr. E. W. Buckley

We pause on the threshold of the seventh year of the existence of the journal to pay tribute to the passing of Dr. E. W. Buckley of St. Paul, who may be fittingly termed the father of MINNESOTA MEDICINE.

The story of how the journal was instituted by action of the House of Delegates in Duluth in 1917 is an interesting one. The association committee of five members appointed to investigate the proposition of launching an association journal reported unfavorably at this annual meeting. Dr. Buckley, a member of the committee, after a thorough investigation of conditions in other states, was convinced that the size of the association warranted the publication of its own journal. This opinion, which amounted to a conviction, led him to present a minority report and his presentation of the case led the House of Delegates to undertake the publication of MINNESOTA MEDICINE.

That MINNESOTA MEDICINE has weathered its first six years of existence is fitting tribute to the judgment of Dr. Buckley.

MISCELLANEOUS

WHY DOCTORS BUY WORTHLESS AND FRAUDULENT SECURITIES

BY SAMUEL O. RICE

Educational Director, Investment Bankers Association of America

Physicians who number bond men, investment bankers, among their patients frequently complain that bond men squander their health.

"The heads of three bond houses," my family doctor said to me the other day, "are patients of mine, they and several subordinate officers of other houses, and I'll be hanged if they aren't more careless with their health than is all the rest of my practice put together. They'll work like demons for months at a time and then try to make up for the loss of daily exercise and common sense routine by trying to crowd a year's recreation into a few weeks. They'll eat, and drink, too, a lot of stuff that's bad enough at home, but is doubly damaging when they take frequent business trips with irregular hours, heterogeneous food and the unavoidable strain of an exacting business. They are the worst spendthrifts of health that I know among intelligent men."

"At least they are not as bad as doctors," I replied to my friend's amazement. "When they need medical service you've got to admit they don't go to quacks for it. They go to the reputable profession and to recognized specialists don't they?"

"What has that got to do with it?" the doctor asked. "Physicians can't avoid irregular hours, but they're not—"

"The argument is," I interrupted, "on the use of common sense, isn't it? You say that bond men don't use common sense about health. But as lax as they are in that, they are not as lavish in squandering health as physicians are in squandering money in so-called investments. Bond men at least exercise common sense enough to realize that it requires a doctor to exercise medical judgment for them. How many physicians realize that it requires a 'doctor' of investments to select investment securities dependably? Ever hear of an investment banker being swindled by a quack practitioner? How often are physicians swindled by quack investment schemes?"

"There are just two reasons why doctors, as a class, are notable for buying worthless securities. One of them is their failure to realize that in seeking good, sound investments you have to do exactly the same thing you do in seeking health—consult an honest, competent practitioner."

"What's the other reason why we buy worthless securities?" my friend asked with a smile. "Because doctors are not business men?"

"That's the reason usually given, but I don't believe there's anything to it. The second reason is too much optimism."

"There isn't one of you who doesn't believe that next year's practice is going to be a whole lot more remunerative than this year's. Your first years of practice, when you started with nothing and gradually built up your income, taught you that. It's firmly fixed, perhaps subcon-

sciously, in every doctor's mind. It's a life thought-habit of the profession, besides being a somewhat common human trait.

"Well, if things are going to be better next year, I'll just take a few hundred dollars of the stock of this patent electrical device or in that new serum outfit," you argue. Thousands of little oil and mining companies have been organized in the last few years among little groups of friends in every town, city and hamlet in the United States and have blown up after losing the money put into them. I'll wager that in every such little venture 90 per cent of them have had one or more physicians as stockholders. As a profession, you are so confoundedly optimistic you let your optimism run away with your better judgment, and you accumulate a lot of nondescript interests in a number of things you know nothing about and that have little or no value when your widow tries to realize on them."

"Yes, I guess some of that is possibly true," my friend admitted.

"True—of course, it's true. Six months ago I had a little ready money and I asked you to send me your bill. I telephoned you twice. I got that bill last week, six months after I had put my little ready money into some sound investments selected by an investment specialist and not by inexperienced friends or an easy-talking promoter. Now, when I'm shy of cash, you optimistically send me a bill. I'll bet you \$4 you are going to buy a new car. You are careless about collections, partly because it is in the code of your profession not to be mean and grasping. I honor you for that, but your eternal optimism is also a part cause. Oh, you say, I'll get more money next month; if not from Jones, from Smith. And you base your investments on the same kind of careless optimism.

"I'm serious in this, Roy. You wouldn't have a bit of sympathy for me if I disregarded the common sense that the medical profession has patiently drummed into the public for years, the fact that the public must consult reputable, competent medical advisers. You'd have a silent contempt for me if I let some quack or gaudy fake practice in my family or if I answered a cure-all medical advertisement.

"The so-called intelligent public has learned its lesson in medicine, that of consulting reputable practitioners. It is just as important that the medical public learn the same lesson as applied to investing on money. You nor no other physician can judge an investment security dependably, if you continue attending to your legitimate vocation. Even if you had time to do it, very frequently you haven't the facilities to determine the worth of a security. Investment banking is such a highly specialized calling that I doubt if any man has the ability to perform the investment banker's work without adequate training in the work.

"Physicians should be the first persons in the world to recognize this fact, but strange to say, many of them do not. As a consequence, they are notably heavy losers in bad investments. And the cure for this bad investment condition is the same as in human pathological conditions—consult the reputable specialist who is competent to treat the case."

COMMUNICATIONS

Fergus Falls, Minn., December 19, 1923.

To the Editor:

The "Proceedings of the House of Delegates," published in the December number of MINNESOTA MEDICINE, should be read by all. The president's address and the committee reports are full of very valuable suggestions. It is a duty and a pleasure to give them careful reading and full consideration. In no other way can one keep in touch with the society's accomplishments and aspirations.

At this time, I wish particularly to call attention to the report of the Committee on Medical Education and Hospitals. Their conclusions were reached after exhaustive study and investigation.

Our medical school is on the verge of becoming one of the greatest in the world. To this end the whole-hearted support of the profession is greatly needed. The recent generous gifts are notable. There are reasons for thinking that the Rockefeller Foundation will meet us half way.

Note the following recommendations of the Committee:

(1) That a state-wide campaign be inaugurated to induce wealthy patients and friends to donate funds to the medical school.

(2) That an effort be made to have the Minneapolis General Hospital placed on the campus.

(3) That plans be perfected for carrying graduate medical instruction to various parts of the State. This is being successfully carried on in several states, notably Pennsylvania.

(4) That the courses for practitioners at the University be extended. That they be given wide publicity and the support of the county societies.

(5) That the profession at large support the law which permits state or county to stand the cost of hospital care at the University Hospital, thus removing this item from the University educational budget.

W. L. BURNAP.

OBITUARY

DR. EDWARD W. BUCKLEY

Dr. Edward W. Buckley of St. Paul was born on a farm in Washington County near Stillwater in 1859. He died September 26, 1923, at St. Joseph's Hospital, St. Paul.

When a child he moved with his parents first to Minneapolis and later to Mankato, where he attended the grade and high schools. He attended Holy Cross College at Worcester, Massachusetts, but left before completing his course and took up telegraphy. Three years later he began the study of medicine at the College of Physicians and Surgeons in New York City. On receiving his medical degree in 1888 Dr. Buckley spent a year at the City Hospital on Blackwell's Island. It was during undergraduate days that a friendship began between Dr. Buckley and his classmate, the late Dr. J. W. Bettingen—a friendship destined to be lifelong. At the same time the late Dr. Arthur J. Gillette

was doing post-graduate work in the New York Hospital for Ruptured and Crippled Children and the three St. Paul physicians became fast friends.

On completing his medical training Dr. Buckley came directly to St. Paul, locating in a rather sparsely settled and poorer district of the city, on Case street, where he engaged in practice. Early in his career he became interested in fraternal insurance and became active in the Independent Order of Foresters and the Ancient Order of the Hibernians. Later he held various offices in the order of the Knights of Columbus and as supreme physician displayed his genius for organization, and his perfection of the insurance department of the order led to his recognition as an authority in the medical conduct of these societies.

As the organization of the Knights of Columbus increased in size their medical supervision demanded more and more of Dr. Buckley's time and of late years all his activities were directed to this class of insurance. Notwithstanding the increasing demands upon his time he still found time to advise, help and console many of his old time patients.

In 1892 Dr. Buckley was married to Miss Mary Kennedy of St. Paul, who, with a daughter, Margaret, survives him.

In 1893 Dr. Buckley was secretary of the Ramsey County Medical Society and in 1919 became its president. As a member of the Board of Trustees of the Building Fund of the society his experience and advice in financial matters were always greatly valued. It was largely due to the force of his personality that MINNESOTA MEDICINE was launched in 1918 as the Journal of the Minnesota State Medical Association.

For years he was a member of the staff of St. Joseph's Hospital and a few years ago at the reorganization of the staff he was elected Chief of Staff.

During the World War Dr. Buckley went to France and had an important part in establishing and organizing the activities of the Knights of Columbus among the soldiers. In recognition of his war work he was made Chevalier of the Legion of Honor and was personally decorated by Marshal Foch. In the summer of 1921 as a member of the commission which presented the city of Metz with a statue of Lafayette, a gift from the Knights of Columbus, he again visited France and shared the regal entertainment extended the commission by the French government.

It was on this occasion that Dr. Buckley was decorated with the Legion of Honor and with the similar decoration as a Commander of the Order of Morocco, by General Lyanty. For war work in Italy, instituted by the Knights of Columbus during the war, he was made a Knight of Saint Gregory by Pope Benedict VII.

Three years ago Dr. Buckley was appointed chairman of the National Tuberculosis Commission of the Knights of Columbus, which work was under consideration at the time of Dr. Buckley's death.

Dr. Buckley was an honorable and upright member of the medical profession, always ready to take a vigorous part in public affairs affecting the profession and people at large. Being somewhat of a parliamentarian, he rather enjoyed enforcing Robert's Rules of Order when presiding over a gathering. He had a special gift for summing up a situation and presenting in his forceful way his opinion of the

correct procedure. His ability as a public speaker enabled him to be a great leader in his chosen field of medical activity but his firm exterior concealed a sympathetic nature which was well known to his many friends.

DR. SAMUEL C. McCORMICK

Dr. Samuel Carson McCormick, aged 86, said to have been the oldest practicing physician in the state, died November 17, after an illness of seven months.

Doctor McCormick was born in Pennsylvania, Sept. 8, 1837. He was a graduate of Lewisburgh university, now Bucknell college. In 1861 he graduated from Jefferson Medical college and was appointed first assistant surgeon in the United States army and served throughout the war. He is survived by his widow and two sons, C. P. McCormick, Seattle, Wash., and W. S. McCormick, of Duluth.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

ST. PAUL CLINIC WEEK

The fourth annual St. Paul Clinic Week will be held Tuesday to Friday, inclusive, January 15 to 18, 1924. Headquarters will be at the St. Paul Hotel.

Clinics will be held at the various hospitals each morning during the session. The afternoons will be devoted to the following symposia and addresses by eminent specialists:

TUESDAY AFTERNOON

Symposium—Intestinal Obstruction

Dr. E. M. Jones, St. Paul—Etiology

Dr. F. J. Plondke, St. Paul—Surgical Differential Diagnosis

Dr. J. A. Lepak, St. Paul—Medical Conditions Simulating

Dr. A. MacLaren, St. Paul—Treatment

Address—Surgical Reconstruction of Certain Excretory Ducts

Dr. Lewis L. McArthur, Chicago

WEDNESDAY AFTERNOON

Symposium—Life Insurance

Dr. J. Allen Patton, Medical Director, The Prudential Life Insurance Company of America

Dr. F. L. Grosvenor, Medical Director, The Travelers Insurance Company of Hartford, Conn.

Dr. Robert L. Rowley, Medical Director, The Phoenix Mutual Life Insurance Company

Dr. D. E. W. Wenstrand, Medical Director, The Northwestern Life Insurance Company of Milwaukee

Address—Reconstructive Surgery and Industrial Insurance
Dr. Harry E. Mack, Chicago

THURSDAY AFTERNOON

Symposium—Irregularities of the Heart

Dr. C. N. Hensel, St. Paul

Dr. E. T. F. Richards, St. Paul

Dr. Harold Richardson, St. Paul

Dr. Harry Oerting, St. Paul

Address—Clinical Problems of Chronic Suppuration of the Middle Ear

Dr. George E. Shambaugh, Chicago

FRIDAY AFTERNOON

Symposium—Etiology and Diagnosis of Diseases of the Kidney and Ureter

Dr. E. T. Bell, Minneapolis

Dr. Arnold Schwyzer, St. Paul

Dr. E. T. Herrmann, St. Paul

Dr. F. E. B. Foley, St. Paul

Diagnostic Clinic in Prostatism

Dr. W. F. Braasch, Rochester, Minn.

Wednesday evening a buffet supper has been arranged to be followed by an informal stag entertainment.

Thursday evening the annual meeting and banquet of the Minnesota Academy of Ophthalmology and Otolaryngology will be addressed by Dr. George E. Shambaugh, of Chicago. This meeting is open to all physicians interested.

The final program will be placed in the mail not later than January 5th.

THE MINNEAPOLIS SURGICAL SOCIETY

MINNEAPOLIS, MINN.

January 10th, 1924

NORTHWESTERN HOSPITAL

9:00 to 12 A. M.

Operative Clinics

DR. MANN	DR. LAW	DR. BULKLEY
DR. POPPE	DR. YOERG	DR. NORDLAND

Followed by Pathological Conference

DINNER AT MINNEAPOLIS ATHLETIC CLUB

6:30 P. M.

HENNEPIN COUNTY MEDICAL SOCIETY ROOMS

8:00 P. M.

"Surgery of the Gall Bladder"

By DR. E. S. JUDD

ROCHESTER, MINNESOTA

All medical men are invited to attend the dinner and all parts of the program.

THE MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE RAILWAY SURGICAL ASSOCIATION

The Minneapolis, St. Paul & Sault Ste. Marie Railway Surgical Association held a full two-day scientific session on December 11 and 12, at Minneapolis, Minn., presided over by President Dr. John V. R. Lyman, Eau Claire, Wisconsin.

The following officers were elected for the ensuing year: President, Dr. F. Gregory Connell, Oshkosh, Wis.; vice

president, Dr. George G. Eitel, Minneapolis, Minn.; secretary-treasurer, ex officio, Dr. John H. Rishmiller, Minneapolis, Minn.

The next place of meeting was left to the discretion of the officers.

RICE COUNTY MEDICAL SOCIETY

Members of the Rice County Medical Society held their annual meeting in Northfield, Friday, November 20. The paper of the evening was read by Dr. Walter Rumpf, of Faribault, his subject being "The Treatment of Diabetes."

Officers elected for the coming year are: President, Dr. F. M. Babcock, Northfield; first vice president, Dr. F. J. Lexa, Lonsdale; second vice president, Dr. C. J. Plonske, Faribault; secretary-treasurer, Dr. C. M. Robilliard, Faribault.

SCOTT-CARVER COUNTY MEDICAL SOCIETY

At the annual meeting of the Scott-Carver County Medical Society held at Jordan, December 6, 1923, the following officers were elected for the coming year: President, Dr. F. J. von Bohland, Belle Plaine; vice president, Dr. F. H. Buck, Shakopee; secretary-treasurer, Dr. H. W. Reiter, Shakopee. Dr. F. H. Buck was elected to the board of censors. Dr. H. W. Reiter was chosen to act as delegate to the annual meeting of the State Medical Association with Dr. John Landenberger, of New Prague, as alternate.

STEELE COUNTY MEDICAL SOCIETY

Dr. J. F. Smersh, of Owatonna, was re-elected president of the Steele County Medical Society at the annual meeting and dinner held in Owatonna, November 20, 1923. Other officers elected for the coming year are: Vice president, Dr. B. Melby, Blooming Prairie; secretary, Dr. A. B. Hart, Owatonna; treasurer, Dr. F. M. Smersh, Owatonna. Dr. J. H. Adair, Dr. J. W. Andrist and Dr. A. B. Stewart, all of Owatonna, were elected censors.

Dr. Charles S. McVicar, of Rochester, the principal speaker of the evening, gave an illustrated lecture on "The Diagnosis of Dyspepsia."

WASHINGTON COUNTY MEDICAL SOCIETY

The Washington County Medical Society held its annual meeting at Stillwater, Tuesday evening, November 13, 1923. Dr. H. K. Van Norman, superintendent of the Miller Hospital, St. Paul, addressed the society on the subject of hospitals with special reference to hospital staffs. A report of the state medical meeting was given by Dr. J. W. Stuhr, as delegate.

Officers for the ensuing year were elected as follows: President, Dr. F. G. Landeen; vice president, Dr. J. W. Stuhr; secretary-treasurer, Dr. R. J. Josewski. Dr. D. Kalinoff was elected to membership on the board of censors, Dr. A. E. Brown as delegate to the 1924 meeting of the State Medical Association, and Dr. E. B. Freligh as alternate.

OF GENERAL INTEREST

Dr. O. S. Werner, formerly of South Haven, has located in St. Hilaire for the practice of his profession.

Dr. A. E. Mark, St. Paul, has moved to Los Angeles, Cal., where he will continue the practice of internal medicine.

Dr. Stuart H. Anderson, formerly of Wells, has become associated in the practice of medicine, with Dr. A. E. Johnson at Red Wing.

Dr. J. S. Kilbride, of Canby, who has been doing post-graduate work in surgery in the hospitals of Chicago, has returned to his practice in Canby.

Dr. Carl Goehring, formerly of the Mayo Clinic, Rochester, is now located in Steubenville, Ohio, where he will practice general medicine.

Dr. and Mrs. Haldor Sneve, of St. Paul, who have been in Santa Barbara, Cal., the past few months, have moved to San Diego, where they expect to spend a year.

Dr. R. E. Farr, Minneapolis, addressed a meeting of the McLeod County Medical Society, December 13, on "Local Anesthesia; Its Technic and Clinical Applications."

Dr. Robert Guilmette, of Minneapolis, has become associated in the practice of medicine with Dr. A. W. Swedenburg, of the Swedenburg Hospital at Thief River Falls.

Dr. H. J. Hanson has disposed of his practice at New London and is now located in Minneapolis. Dr. H. S. French, formerly of Grove City, has taken over the practice at New London.

A group of fifty students, three of whom are women, was graduated from the medical school of the University of Minnesota at the all-university commencement exercises of the fall quarter in 1923.

Dr. F. C. Rodda, Minneapolis, associate professor of pediatrics at the University medical school, has been appointed acting head of the pediatrics department to succeed Dr. Clemens Pirquet, of Vienna, who resigned in October after holding the position less than a month.

Dr. H. P. Ritchie, of Saint Paul, was elected secretary-treasurer of the Western Surgical Association at the annual meeting held in Colorado Springs, Colorado, December 6 to 8, 1923. Dr. Donald McRae, of Council Bluffs, Iowa, was elected president of the association.

Following a period of five years of service as medical superintendent of Fair Oaks Lodge Sanatorium at Wadena, Dr. George McLeod Waldie has resigned, his resignation to become effective January 1, 1924. Dr. Waldie will be succeeded as head of the sanatorium by Dr. J. J. McKinnon, of Wadena.

Dr. M. George Milan, formerly medical director of the Oak Park Tuberculosis Sanatorium at Thief River Falls, is now a member of the medical staff of the Warren Hospital, Warren, Minnesota, where he assumed his duties January 1, 1924. Dr. Milan succeeds Dr. W. W. Holley, who resigned recently to go to California.

Dr. Harold Rypins, of Minneapolis, has been granted a

year's leave of absence from the University of Minnesota to act as secretary of the New York State Medical Board. Dr. Rypins has in charge the promotion of legislation requiring annual registration of all practitioners in New York. In this way it is hoped that all charlatans shall be driven from the state.

Two Minnesota physicians, Dr. Henry F. Helmholtz, of Rochester, and Dr. A. J. Chesley, of St. Paul, were recently elected as directors of the American Child Health Association, of which Herbert Hoover is president. Five others elected to the directorate at the same time are Dr. Louis I. Dublin and E. L. Thorndike, New York; Christian A. Harter and C. O. Williams, Washington, D. C.; and Dr. Henry F. Vaughan, Detroit, Michigan.

At a meeting held in St. Paul the latter part of November, 1923, for the purpose of organizing the Great Northern Railway Surgeons Association, the following physicians were elected to office in the society: President, Dr. P. A. Baxter, of Libby, Montana; first vice president, Dr. R. N. Simpson, Winnipeg; second vice president, Dr. J. N. Cunningham, Spokane, Wash.; third vice president, Dr. Roscoe Webb, Minneapolis; secretary-treasurer, Dr. Harold Hulsiek, St. Paul.

In October, the St. Louis Star succeeded in exposing a ring of diploma venders in St. Louis and Kansas City. The investigation has extended to Connecticut, Arkansas and other states where eclectic boards of medical examiners appear to have found an open door. No purchaser of a bogus high school or medical diploma could pass a properly conducted license examination and this outrageous procedure is simply additional proof of the necessity of a medical examining board of professional standing and personal integrity. Minnesota has not been implicated in this scandal.

The method of sending indigent patients to the University hospital is not generally understood. Any town or county official may recommend that a patient be sent to the hospital. The county commissioner will then have a physical examination made and assure himself that the financial status of the patient warrants state and county (the county pays half the expense) support. Application forms may be obtained from the University hospital superintendent. The hospital will not take mental cases, persons with acute tuberculosis, orthopedic cases, contagious diseases nor chronic cases which will not be relieved by treatment over a definite period.

At the meeting of the Board of Regents of the University held December 11, 1923, the following officers were re-elected: President, Fred B. Snyder; vice president, M. M. Williams; secretary, A. J. Lobb.

Fellowships at the Mayo Foundation, Rochester, were granted by the Board to the following: John G. Anderson, Frederick A. Bothe, Donnell B. Cobb, Granville S. Delamere, Jackson K. Holloway, Russell O. Lyday, Robert Mailer, Alfred L. Mayfield, Norman B. Muhme, Samuel H. Nixon, John Wesley Stinson, Isaac M. Webber, Joseph Daly, Howard L. Sargeant, Knut H. Houck, Christian J. Rohwer, John F. Gipner, Ellis B. Gray, Lillian M. Mayer, Samuel W. Becker, Stephen T. Parker and Donnan B. Harding.

A service to the entire state of Minnesota will be performed by the Child Guidance Clinic, which was opened Nov. 1, at the University of Minnesota for the experimental year during which it will be financed by the Commonwealth Fund of New York.

The purpose of the clinic is to examine, study and suggest treatment for children of abnormal behavior, so that remedial care can begin in early youth before the troubles become too firmly rooted.

Dr. Lawson Lowry has been appointed director. Working with him he will have a staff of psychologists, social workers and clerks, as well as a number of interested members of the medical profession.

Social agencies or the authorities in any community in Minnesota may send children to the clinic for observation. Parents or guardians also may present children whom they would like to have examined.

Following the demonstration year during which the clinic will be at the University, both Minneapolis and St. Paul will establish permanent clinics for child guidance according to present plans.

Attention is again called by the Collector of Internal Revenue to the necessity of exchanging narcotic order forms issued before 1923 for the current issue, as old forms will not be honored after January 1, 1924. In fairness to the druggists it is incumbent on physicians to comply with this regulation. Old forms should be sent to L. M. Willcuts, Collector of Internal Revenue, Federal Bldg., St. Paul, with the sum in cash of two-thirds of a cent for each old form which has been used in the old book.

According to the Harrison Narcotic Law prescriptions issued habitues to keep them comfortable and not in an attempt to cure the habit are illegal. Two exceptions to this situation are cited: (1) in incurable diseases such as cancer, tuberculosis, etc.; (2) in aged and infirm addicts where withdrawal would result in death. In the first mentioned exception endorsement should be made on the prescription that patient is suffering from an incurable disease or (Exception (2) article 117): in case of the second exception statement should be made on the prescription that patient is infirm and aged and drug is necessary to sustain life, or (Exception (2) article 117).

The bureau has never sanctioned the so-called reductive ambulatory treatment of addiction, and rightly so.

The Army is making an intensive campaign for procuring officer material for the reserve corps of every branch of the service. A communication has been received recently from the Surgeon General calling attention to the importance of organization of an adequate reserve corps in the medical corps in order to be prepared, medically speaking, for any national crisis. The reserve corps cannot be called into active service unless a national crisis arises.

The medical reserve corps has room for several thousand more officers—especially first lieutenants and captains. Appointments of first lieutenants may be obtained without examination by graduates of recognized medical schools, who have passed National or State Board examinations. A former medical officer of the Army desiring appointment in a higher grade than that he held while in the service must appear before a board of officers for examination. The stringent requirements heretofore in effect in such cases

have been lessened somewhat. A former first lieutenant in the medical corps, during the World War, who served satisfactorily on active duty in that grade for more than six months is eligible for appointment by examination to the grade of captain; also are those officers over 31 years of age now, who served satisfactorily on active duty in the grade of first lieutenant for less than six months. Those former captains of the Army, who served satisfactorily on active duty for at least one year and held the grade of captain for at least three months and whose records indicate that they possess the necessary qualifications for a field grade, may apply for the grade of major. Those ex-medical officers, who served satisfactorily on active duty for at least one year, held the grade of major for at least three months and whose records indicate that they possess the necessary qualifications for the higher grade, are eligible for appointment by examination to the grade of lieutenant-colonel.

Communications may be addressed to Major R. W. Whittier, 400 Kasota Bldg., Minneapolis, Minn.

A dinner was given December 4, 1923, at the Hotel Commodore, New York City, by the Rockefeller Foundation in honor of a group of health officers representing eighteen foreign governments, who for the past three months had been in the United States under the auspices of the Health Section of the League of Nations for the study and observation of various types of public health organization.

Dr. George E. Vincent, President of the Foundation, presided at the dinner. Dr. William H. Welch, Director of the Johns Hopkins University School of Hygiene and Public Health, in the absence of Dr. F. F. Russell, General Director of the Foundation's International Health Board, extended greetings to the foreign visitors on behalf of the public health workers of the United States. The other speakers were Mr. John D. Rockefeller, Jr., Chairman of the Board of Trustees of the Rockefeller Foundation; Dr. Hugh S. Cumming, Surgeon General of the United States Public Health Service; Dr. Linsly R. Williams, Managing Director of the National Tuberculosis Association; Dr. W. S. Rankin, State Health Officer, North Carolina; and Dr. Norman V. Lothian, of the Health Section of the League of Nations.

The visit of these health officials to the United States represents the third general interchange of public health personnel arranged by the Health Section of the League of Nations. The first took place in Belgium and Italy in 1922, and the second in England and Poland during February, March and April, 1923.

In the present group are representatives delegated by their respective governments, among them many of the most eminent sanitarians in the world, from France, England, Italy, Russia, Poland, Spain, Holland, Belgium, Greece, Yugoslavia, Germany, Switzerland, Norway, Mexico, Salvador, Brazil, Chile and Canada.

The system of international interchange of public health personnel was made possible by a contribution to the Health Section of the League of Nations from the International Health Board of the Rockefeller Foundation, amounting to \$60,080 a year, for a period of three years. The object of the plan is to bring the public health personnel of different countries into closer relationship with each

other, to effect a mutually profitable exchange of views on health subjects, to make comparative studies of health organization and legislation in different countries, and to promote international co-operation in establishing uniform standards for public health regulations.

NEW AND NON-OFFICIAL REMEDIES

In addition to the articles enumerated in our December issue, the following have been accepted by the Council on Pharmacy and Chemistry:

ABBOTT LABORATORIES:

Butesin.

E. BILHUBER, INC.:

Afenil.

Ampules Afenil.

CUTTER LABORATORIES:

Diphtheria Antitoxin Globulin.

Glycerinated Vaccine Virus.

Gonococcus Vaccine.

HOFFMANN-LAROCHE CHEMICAL WORKS:

Iodostarin.

Chocolate Tablets Iodostarin-Roche.

Chocolate Tablets Iodostarin-Roche 0.25 Gm.

PARKE, DAVIS & CO.:

Carbon Tetrachlorid (Human Use)-P. D. and Co.

Butesin.—*n*-butyl-para-aminobenzoate. Butesin is the normal butyl ester of 4-aminobenzoic acid. The actions and uses of butesin are similar to those of benzocaine (anesthetin), which is the ethyl ester of 4-aminobenzoic acid (see New and Non-official Remedies, 1923, p. 41, Anesthetics, Local, Difficultly Soluble). Butesin is used as a dusting powder, either pure or diluted. It may be used in the form of troches, ointment, suppositories or dissolved in a fatty oil. Butesin is a white, crystalline powder, odorless, tasteless, almost insoluble in water, but soluble in alcohol, chloroform, ether and in fatty oils. The Abbott Laboratories, Chicago. (Jour. A. M. A., Nov. 3, 1923, p. 1523.)

Diphtheria Antitoxin Globulin.—This product (see New and Non-official Remedies, 1923, p. 283) is also marketed in syringes containing 20,000 units. Cutter Laboratory, Berkeley, Calif.

Glycerinated Vaccine Virus.—This product (see New and Non-official Remedies, 1923, p. 293) is also marketed in packages containing one capillary tube. Cutter Laboratory, Berkeley, Calif.

Gonococcic Vaccine.—A gonococcic vaccine (see New and Non-official Remedies, 1923, p. 304) marketed in vials of 5 c.c. and 20 c.c., each cubic centimeter containing 500 million cocci. Cutter Laboratory, Berkeley, Calif. (Jour. A. M. A., Nov. 17, 1923, p. 1693.)

Afenil.—Calcium chloride urea. A molecular compound of calcium chloride and urea. Afenil has the actions of calcium chloride. It is claimed that when afenil solutions are administered intramuscularly or intravenously, the drug is better tolerated and less irritating than calcium chloride. It is claimed that the intravenous administration of afenil

is indicated in hay fever, asthma and other diseases of the respiratory tract in anaphylactic conditions, skin rashes, urticarias and as a means of preventing severe arsphenamine reactions. Afenil is marketed in ampules containing 10 c.c. of a 10 per cent solution of afenil. E. Bilhuber, Inc., New York.

Silver Nitrate Solution in Capsules-P. D. and Co.—An aqueous solution of silver nitrate contained in capsules composed of beeswax with an inner lining of a hard paraffin. The solution is intended for the prophylaxis of ophthalmia neonatorum in the newborn. The solution is marketed in two forms: capsules containing 6 minims of a 1 per cent solution, capsules containing 6 minims of a 2 per cent solution. Parke, Davis and Co., Detroit. (Jour. A. M. A., Nov. 24, 1923, p. 1789.)

PROPAGANDA FOR REFORM

The Menace of "Moonshine" Whisky.—The untoward results of overindulgence in whisky have usually been ascribed to its alcoholic content, although now and then ill-defined "by-products" of fermentation present in the distillate have been charged with a toxicity out of all proportion to the quantities ordinarily present. The indefinite "fusel oil" and furfurol were often designated as the pernicious ingredients. In properly made and suitably aged whiskies, such constituents could at most play only a minor part in the intoxication produced. While alcoholism is less prevalent today than it was a few years ago, its attendant and after effects on its victims are more serious. The impression is broadcast that this is due to the "moonshine" liquor which is being distributed. The danger from the presence of methyl alcohol in "moonshine" whisky is well-known. Its presence is explained by the use of denatured alcohol (which may contain methyl alcohol) in the preparation of "moonshine" whisky. However, the investigation of the federal authorities indicates that ordinarily methyl alcohol is not the pernicious constituent of illicit whisky, but instead the product has been found often to contain a high proportion of acetaldehyd. The "ranker" the liquor, the higher the aldehyd content. (Jour. A. M. A., Nov. 10, 1923, p. 1611.)

The Composition of Some Complexion Clays.—Next to nostrums sold for the alleged rejuvenation of the male, the most popular form of contemporary charlatanry lies in the exploitation of alleged beautifiers for the female. During the last year or two the cosmetic market has been glutted with a veritable avalanche of so-called complexion clays and face packs. The A. M. A. Chemical Laboratory has analyzed the following preparations of this class: "Terra-derma-lax," "Boncilla," "Domino Complexion Clay," "Mineralava," "Ryerson's Forty Minute Beauty Clay." The laboratory reports that each of the preparations was a bluish mass of the consistency of soft putty and resembled a mixture of clay and water. With one exception, no substance other than clay, water and perfume was found in the preparations. Domino Complexion Clay contained about five per cent of glycerin and about 0.2 per cent of a salicylate, probably sodium salicylate. The examination indicates that the clays analyzed are not high grade products, nor carefully purified before being used. (Jour. A. M. A., Nov. 10, 1923, p. 1624.)

Pregl's Solution.—It has been stated that Pregl's (isotonic) iodine solution is probably prepared by treating a solution of sodium carbonate with finely powdered iodine. When the iodine has dissolved, sodium chloride is added and the solution diluted to a definite volume. The product is stated to contain sodium ions, free iodine, iodide ions, hypiodite and iodate ions—this in addition to the carbonate and chloride. A proprietary brand of this solution is sold in Germany as "Presoid." All favorable reports of the therapeutic use of Pregl's solution have had their genesis from apparently biased sources. (Jour. A. M. A., Nov. 10, 1923, p. 1628.)

Iridinol.—The Council on Pharmacy and Chemistry reports that about fifteen years ago "Iridium (Medicinal)" was put on the market by the Platinum Co. of America, and the same company manufactured "Iridinol," which was marketed by the P. H. Potter Chemical Co. (now P. H. Potter and Sons, Inc.), New York. Both products were, at that time, claimed to contain iridium and were marketed for a high price with grossly misleading claims for the efficacy of iridium as a therapeutic agent. Iridium (Medicinal) seems to have been abandoned, but Iridinol, advertised by P. H. Potter and Sons, Inc., as an "ethical preparation" continues to be sold. In the earliest advertising Iridinol was claimed to be a "nontoxic preparation of iridium." At that time the A. M. A. Chemical Laboratory was unable to detect the presence of iridium, and it was concluded that no very large amounts of iridium could have been present. Regardless of the presence or absence of iridium, there is not the slightest evidence for the therapeutic value of this metal in the conditions for which it is recommended by the exploiters of Iridinol. In the present advertising for Iridinol no definite claim is made for the presence of iridium. Instead the agents merely imply its presence. Iridinol is recommended by the exploiters in anemia, rheumatism, specific blood diseases, diseases of the nose and throat, of stomach organs, liver and kidneys, of the nervous system, diseases of children and as a systemic alterative. In view of the long-continued activities of P. H. Potter and Sons, Inc., for the use of Iridinol, the Council authorized publication of a report for the information of physicians who may be importuned to use it. (Jour. A. M. A., Nov. 24, 1923, p. 1807.)

Whooping Cough Vaccine.—In a series of articles on biologic therapy prepared under the auspices of the Council on Pharmacy and Chemistry, W. C. Davison (The Journal, Jan. 22, 1921, p. 242) concluded a review of the use of pertussis bacillus vaccine thus: "In summing up the prolific and somewhat contradictory literature on this subject, it may be concluded that injections of Bordet-Gengou bacillus vaccines may have a slight though unreliable prophylactic effect, and that therapeutic inoculations are of practically no value. Further experiments are necessary to raise this procedure from the limbo of non-specific therapy." The Council on Pharmacy and Chemistry has accepted pertussis bacillus vaccine for New and Non-official Remedies, but states in regard to the usefulness of the product: "The evidence indicating that it is of value for either prevention or treatment is very questionable, and the reports are conflicting." (Jour. A. M. A., Nov. 24, 1923, p. 1809.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of November 14, 1923

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, November 14, 1923, at 8 o'clock. In the absence of both the president and vice president, Dr. Taylor called the meeting to order.

Dr. Taylor appointed Drs. Christison, Burch and McCloud a committee to draw up a suitable memorial for Dr. Warren A. Dennis, one of our past presidents, who had passed away since the last meeting of the Academy.

The minutes of the October meeting were read and approved.

The following case reports were given:

DR. OSCAR OWRE reported a case. (No history.)

DR. HENRY ULRICH reported a case and showed x-ray film of a Charcot hip.

Case seen in consultation with Dr. John Sessions. Young man 35 years old who began to limp and have some embarrassment of motion in left hip. Physical examination was negative so far as heart, lungs, etc., were concerned. X-ray of the hip showed a large tumor mass and a diagnosis of sarcoma was made. Neurological examination proved it to be a case of tabes with Charcot hip.

The rarity of Charcot hip is the only reason for bringing this case before you.

DR. GEO. DOUGLAS HEAD reported a case of pellagra.

The states of Wisconsin, Minnesota, North and South Dakota are considered as a non-pellagrous area, no well-authenticated cases having been reported. This is in strange contrast to many of the southern states, such as South Carolina, with its 1,000 cases, and Georgia with 2,000 cases, as reported in the 1910 U. S. census.

The following case which I have to report, is of interest, first, because it developed in South Dakota and is the first case to be reported from that area, and, second, because the patient had been deprived of meat proteins for about two years prior to the onset of the disease, and, third, because of the prompt recovery upon a meat diet and the use of cacodylate of soda intravenously.

Mrs. Emil B., 50 years, married, three children, living at Mellette, S. D., was referred to me by Drs. Kleger and McCauley, March 29, 1923, complaining of nervousness, soreness of mouth, diarrhoea, and a dirty brown rash over the forearms and hands. Her family history was negative. One sister dead of goiter. She had always been well until two years ago when she had a lot of teeth extracted, after which she began to feel tired. At Christmas time of 1922 she was very nervous and felt as if she would go to pieces. This feeling of exhaustion increased and in March of 1923 her mouth became sore and red and hurt her when she chewed food. About this time she began having seven or eight loose stools a day, and her rectum pained and burned. At this time also the skin on the forearms, halfway to the elbows, took on a dirty brown, scaly appearance. The rash gradually extended to the back of the hands and fingers. About two weeks after the rash appeared, the skin began to crack about the wrists. She had no headaches but was

confused in her mind and slow in her speech and thought. Her eyesight became blurred. She could not concentrate her mind upon whatever she might be doing. The diarrhea had stopped about two weeks before the examination was made. She had lost 25 pounds in weight. She stated that she had lived in the town of Mellette, S. D., for the last forty years, that she had in no way changed her diet or mode of living until after the teeth were removed two years before, when she stopped eating meat and had eaten soft foods, such as milk toast, cream of wheat, potatoes, carrots, cabbage, bread and butter, cream, cooked fruits, grapefruit, soft puddings, cake and pie.

The examination revealed a fairly well-nourished woman of rather stocky build, brown hair and eyes. Her color was a pasty white, somewhat suggestive of myxedema, or possibly early pernicious anemia. Pupils reacted to light and accommodation. Knee jerks were active. No incoordination. Her speech was slow and her mental responses sluggish. The mucous membrane of the lips and gums and inside of the mouth and the tongue was fire red, as shown in the color plate. There was a fine, whitish exudate, like that accompanying the spirillum of Vincent infection over the roof of the mouth and the jaws. This was easily wiped off. In places the mucous membrane hung down in folds. A remarkable crusty, dirty brown pigmentation and rash was present from about the middle of the forearms downward, extending over the backs of the hands and on the proximal parts of the fingers, as shown in the water color drawings. On the inside of the wrist the skin was cracked and red in the crevices. The rash had a rough, raised feel and a bran-like exudate could be rubbed off. The rest of the body was free of this skin rash, except a scaly, brownish area, the size of a dollar, over the dorsal surface of the right foot. There was a scaly, dark brown pigmentation and rash about the anus, and the mucous membrane of the rectum was red and angry looking. The rest of the physical examination was negative, except that there was some difference in the muscle strength in the extremities, the left arm and leg being stronger than the right. The urine findings were negative except a trace of albumen and an occasional narrow hyaline or granular cast. The blood findings showed a fairly high grade secondary anemia, hemoglobin 65 per cent, red cells 3,296,000 and leucocytes 6,250. Differential count: P. M. N. 70.0, small monos. 19.5, large monos. 7.0, trans. 0.5, eosinos. 2.5, myelocytes 0.5, no nucleated reds seen, no polychromatophilia, no basophilic stippling, no anisocytosis. Wassermann test negative. Blood pressure 132 systolic, 90 diastolic. Smears from the exudate upon the gums and roof of the mouth showed no spirilla of Vincent, but a long bacillus and diplococci.

A diagnosis of pellagra was made and the patient placed upon a liberal meat diet, with beef juice, and daily intravenous injections of freshly made cacodylate of soda, two to five grains to the dose. She improved steadily but slowly. She was dismissed from Abbott Hospital on May 21st, less than two months after her admission, the dermatitis and pigmentation gone, the mucous membranes free of redness and irritation, the weakness and exhaustion much improved, and her anemia corrected to a large degree. A letter from her in July reports no recurrence of the rash or other symptoms.

Dr. Joseph Goldberger, of the U. S. Public Health Serv-

ice, the recognized authority on pellagra in this country, and Dr. John Butler saw and examined the patient and the plates near the close of the treatment and pronounced the condition a case of true pellagra.

DISCUSSION

DR. CROSS: As Dr. Head has just said, the Northwest is not supposed to be a pellagrous area. There have been several well-authenticated cases of pellagra, however, in recent years which must have originated in the Northwest. Dr. Chas. Granger diagnosed such a case in Rochester about five years ago which was reported in full in the *Journal-Lancet*. The outcome of this case I do not remember, but I believe it recovered.

Two years ago I saw a woman in Red Wing, whose condition admitted of no question as to her being afflicted with pellagra. She was 52 years old and had lived her entire life in Idaho, with occasional visits to Minnesota. Up to four months before my examination of her she had been a strong, healthy woman, living in the pine country where her husband was foreman in a lumber mill. An operation four months before she was seen by me, for gallbladder trouble had resulted in a normal convalescence and return to Idaho. She did not recover her normal strength; in fact became weaker and more somnolent. When seen a few days before her death she was supposed to have uremia. It was difficult to get any reply although she was attentive and seemed to understand when questioned. There was no coma, no pain. The typical pigmentation of the hands and forearms was present, as were also large purpuric spots on the thighs, arms and chest. The history was typical. No autopsy was obtained.

Dr. Head has spoken of the possibility of other dietetic factors, as for instance a lack of protein. The case above stated, of course, during her convalescence was on a very limited diet for some time. The interesting thing to me is that she had never been south of our latitude.

DR. W. A. JONES: I recall a case that came under my observation two years ago. She came from Indianapolis, and was brought to the hospital suffering from protracted diarrhea, excoriation which covered the buttocks and surrounded the anus, discoloration of the skin which was fairly well marked and characteristic, and a peculiar mental state, a dementia, which I believe is quite common in pellagra. I gave her hypodermics of emetin, put her on a proper diet, and she made a recovery from the pellagra and the mental condition. One interesting point was that she was a morphinist before the pellagra developed. The emetin was given for its psychological effect as well as its effect upon the diarrhea.

DR. HEAD: I think that Dr. McCauley, of Aberdeen, made a tentative diagnosis of pellagra before this case was sent down, and our studies were really only confirmatory of the diagnosis which he had made.

I was very glad indeed that we were able to get the opinion of Dr. Goldberger, because he had stated while he was here that he was doubtful about our having pellagra in this part of the country, and one of the cases which he had come on here to see (a case from Duluth which Dr. Butler had seen) he had pronounced a non-pellagrous case. This case he did not hesitate in pronouncing pellagra after talk-

ing with the woman and seeing these plates and getting her history.

DR. MANN: Did Dr. Goldberger say anything about the cause of it?

DR. HEAD: Dr. Goldberger talked very freely about the research findings which had been carried on under his direction in the South, and he is firmly of the opinion that an alien protein, or the absence of certain proteins in the food, have considerable to do with the disease. He does not think that the older conception—abnormal products in the corn—are causal factors. He believes there are many proteins that may act in a causative way to produce it.

DR. PAUL COOK: I just want to say that there is a typical case of pellagra in the Aberdeen Veterans' Hospital, in St. Paul; at least the case was there three or four weeks ago. This case is of a severe pellagra-typhosus type, with gauntlet-like dermatitis.

DR. E. L. GARDNER read a paper entitled "Hypothyroidism, with Special Reference to Minor Thyroid Deficiencies."

DISCUSSION

DR. L. C. BACON: This excellent paper is so exhaustive and covers so completely the subject that the only discussion which seems proper is to speak of a case of myxedema, which I have been able to follow for over thirty years, because it emphasizes some of the points of the paper.

I saw her first during the early '90's; she was 37 years of age, with the history that she had borne five children and at 33 years of age she passed the menopause. Her husband told me that earlier in life she had been of a happy disposition but when the menopause came she became "dull and foolish." She was a large woman with puffed face, eyelids and lips especially so. The skin was pitted, lips and gums bluish, hair was dry, thin and short, and her expression and actions denoted stupidity and lack of vigor. Constipation was obstinate and she complained of a constant dull headache.

About this time I had been reading, in the London Lancet, the report of the British Commission to investigate myxedema, and I considered this a case of the disease in question. I obtained fresh sheep's thyroids from South St. Paul and had her eat them. The improvement was immediate and marked, and in about four months there was a restoration of the menstrual function, which continued until the late forties. She is a little past seventy now and is happy and hearty for her age.

Some months after I first saw her, thyroid extract came on the market and she has used it in tablet form since. During the first few years of the use of the thyroid extract, when she would reach a point of feeling very well, she would discontinue the remedy and would soon become very constipated and her dull headache would reappear, or if she were taking the tablets and the headache and constipation appeared it would be a warning that that particular lot of tablets was inert and fresh would be obtained. Sharp headaches with rapid heart action would warn her that she was taking too much of the extract and the amount would be reduced. After she understood that she must accept a life sentence and took the extract regularly she remained in good condition and she has enjoyed a happy, cheerful life. She finds that one-half of a 5-grain tablet twice a week about meets her needs.

About five or six years ago I did a cholecystectomy on this patient and she did very well. The wound healed promptly, but about two weeks after the operation the scar became red and infected and suppuration occurred. The thyroid had been overlooked during the period, but when exhibited again, healing was prompt and satisfactory.

DR. H. L. ULRICH: I think Dr. Gardner has shown us very beautifully the variation of the potency of the commercial extracts we have on the market. The basal metabolic rate determinations show the importance of this point, that one must have active extracts to get therapeutic results. There are a good many clinicians who scout these mild types of hypo-thyroid states. Those of us who are on the lookout for these are convinced that there is such a condition, particularly after the fourth decade of life. In regard to the heart: there is no question in my mind that there is such a thing as a myxedema heart, and that these hearts are going about with the diagnoses of myocarditis, valvulitis, etc., whereas there are purely functional changes in the hearts. In hypothyroidism the general muscular tone of the body is depressed and so likewise the tone of the heart is depressed. If you examine these patients with the x-ray you find their hearts hang way down in the chest like a drop-heart. We have just had such a case in the hospital with all the signs of hypothyroidism. There was a blocking in the Q. R. S. complex in the electrocardiogram and this patient had been diagnosed a myocarditis. Under medication of thyroid the insufficiency of the heart has disappeared, she has regained a normal electrocardiogram and all the other symptoms have disappeared.

DR. W. P. LARSON gave a paper entitled "The Problem of Wetting Bacteria." There was no discussion of this paper. The meeting adjourned.

JOHN E. HYNES,
Secretary.

TRANSACTIONS OF THE MINNEAPOLIS SURGICAL SOCIETY

Stated meeting held November 8, 1923, the President, J. M. Hayes, in the chair.

The guest of honor, Dr. C. H. Mayo, favored the Society with a few remarks before departing to take part in another program.

DR. J. F. HEDENSTROM presented a case of splenic anemia which had been operated by Dr. Wilcox.

DISCUSSION

DR. A. W. WILCOX: I think our pediatric division at the General Hospital is to be congratulated upon the complete records of this case of splenic anemia which has been so ably presented by Dr. Hedenstrom. The diagnosis is the result of minute study and keen interest in the work.

The surgical aspects of this case are entirely technical. The diagnosis was made before the patient was transferred to our surgical division, although we had an opportunity to observe the child for some time for operation. One who has observed this child for some time before operation and since operation can hardly believe it is the same

patient, the clinical improvement has been so marked following splenectomy.

In surgery of the spleen, with few exceptions, splenectomy is the only operation done. Occasionally abscesses have been opened or tumors removed but the essential surgery is confined to splenectomy.

Regarding the operation the approach to the spleen can be most practically made by incision through a left rectus incision, although other incisions are recommended, such as transverse incision or incision parallel to the costal margin.

In this particular instance a left rectus incision was selected and excellent exposure of the spleen was obtained. On opening the abdomen some free fluid was found. This was interesting on account of the fact that the child had several intraperitoneal transfusions. The omentum presented a large hematoma in the upper left quadrant, and in addition to this several adhesions between the coils of the small intestines and rather marked fibrous adhesions between one of the coils of the intestine and bladder. The diaphragmatic surface of the spleen was rather firmly fixed to the diaphragm. These adhesions between the spleen and diaphragm were separated and the spleen brought downward, the gastro-splenic omentum on its anterior surface then divided. Although this was easily done there were some places where the adhesions which were rather firm had to be divided by scissors. The spleen was then rolled toward the midline. This gave an opportunity to dissect away the peritoneal adhesions existing between the spleen and left kidney, and also by dissecting close to the splenic tissue the splenic vein and artery came into view and also the tail of the pancreas. Further dissection of these tissues brought the pedicle with the vessels into plain view. The spleen was now quite mobile and the pedicle ligated in two portions and removed.

Another interesting point was the fact that the essential peritoneal covering of the spleen was easily removed from the splenic tissue proper so that when the spleen was removed it looked like a freshly prepared anatomical specimen. Its weight was 160 grams. The histological and pathological reports have not been finished.

In this particular case the technic proved very simple. The essential factors to recapitulate were: (1) complete freeing of the diaphragmatic surfaces; (2) division of the gastrosplenic omentum; (3) the dissection of the posterior surface without injuring the pancreas and exposing the blood vessels.

The child's present appearance, which I thought it would be interesting for you to observe, speaks for the great improvement and its general condition since the operation.

REPORT OF THE TRI-STATE MEETING

DR. R. E. FARR: As all of you know who have read the program of the Tri-State meeting, which was just held at Des Moines, this was one of the most successful adventures of this kind ever carried out. Almost every disease that the practitioner comes in contact with was discussed and brought up to date by experts. It was the greatest galaxy of stars I have ever seen on a program. The large

auditorium was usually well filled by seven o'clock in the morning and all four evenings were taken up. I talked to this audience at the end of the thirteenth hour of work on the first day and there was still a large crowd in attendance. It means that men from all over this part of the country are hungry for post-graduate work.

The meeting was very well handled and as a rule the speakers were held strictly to their allotted time. I might illustrate its excellence by referring to the clinic of Joslin given upon diabetes. About fifty patients with diabetes were sitting upon the stage. Dr. Joslin illustrated his talk and drove home the points by quizzing the various patients and showing how well trained they were in the handling of their own disease. To illustrate the knowledge of the layman who has diabetes compared with that of the average doctor Dr. Joslin asked a doctor in the audience how much sugar an apple which he held in his hand contained. The doctor estimated the amount at one gram. He then asked a little girl of seven the same question. She estimated the amount at fifteen grams. The apple was weighed and it was found to contain sixteen grams of sugar.

The doctor asked another child to step forward and demonstrate the method of examining the urine. He illustrated practically every phase of the disease by the case of some patient who was present.

There seems to be no question but what the medical profession is demanding this sort of entertainment and yet I cannot resist the feeling that there is a possibility of such meetings interfering greatly with the program of our State and County Medical Associations. Dr. Evans of La Crosse told me that the same territory which sent but three men to the Wisconsin State Medical meeting contributed at least twenty to the Tri-State meeting. I think it is well for all of us to have in mind the ultimate effect of this sort of thing upon our national associations.

There are, as you know, two methods of arranging programs. One consists in gathering together specialists from different parts of the country who present their subjects in an extremely attractive manner. The other is the plan carried out by our State and County Medical Societies in which the local members furnish the program almost entirely. Now, provided such programs as that furnished at the Des Moines meeting are presented with sufficient frequency, what effect will it have upon our State and County meetings? In the last meeting of our County Society the attendance was extremely slim. One viewpoint of the general practitioner may be illustrated by the statement made by a man from northern Wisconsin who attended the Tri-State meeting. He said that he considered that he had made a great mistake in spending his time and money attending the State Medical meeting at Milwaukee this year when with very little greater expenditure he could have attended the Des Moines meeting. His idea was that he had practically wasted the time and money spent attending the State Medical Association.

In Ohio they have a plan known as the Dayton plan, which has been followed out for a number of years. The members of that district pay \$10 per year. The lecturers are paid at the rate of \$100 a day and expenses. Six fifty-minute lectures are given for a period of four days. I appeared on this program in October of this year and

found that the Association now numbers two hundred and fifty men and that every man was in his place throughout the four days.

I feel that we should be extremely careful to guard the interests of our County and State Medical Societies which are, as you know, the component parts of our national organization and that every effort should be made to develop as many of the men in the profession as possible. Should the pendulum swing too far the other way I doubt if it would bring the greatest good to the greatest number, which is, of course, what we desire.

REPORTS FROM THE RECENT CLINICAL CONGRESS OF SURGEONS HELD IN CHICAGO

DR. H. B. SWEETSER: If I had thought of bringing some new light to you, I would probably have paid more attention to the stage than I did. The first two days the clinical congress of surgeons was confined to a consideration of hospital matters, and that to me was of very great interest. Here a great many surgeons from all over the country had assembled for the purpose of getting some light on surgical matters. But although they were having clinics every place they spent practically these first two days in this general meeting room in the hospital conference. The auditorium there must have contained probably fifteen hundred people, I think, and it was crowded from early in the morning until they closed at six o'clock. Their discussions were on ways of improving hospital methods. Not only were the men there but they stayed there from morning until night. Not only that, but they discussed all the various activities of the hospital; they discussed members of the staff; nursing problems; interne problems; equipment for the hospital; x-ray; different kinds of laboratories, etc. The discussion was general. They had conferences, and one man presented something and then it would be discussed from all parts of the hall by men from all parts of the country. They all seemed to talk intelligently; they were all interested.

Some of the things they discussed were whether they would have a single charge for laboratory tests or whether they would charge for each test; and there was a division of opinion there. They discussed tonsil cases. That was a long discussion: whether the children for tonsillectomy should be brought in the night before or whether they should be brought in that morning and then operated upon. There was a great difference of opinion about that. Some thought that they should be brought in in the morning. Some said that would so disrupt the families that it could not be done, and it was not necessary. Then they read the standings that were given to the various hospitals throughout the country. In 1918 only 12 or 13 per cent came up to the required standard; in 1923, 86.1 per cent. You see the hospitals have met this requirement for standardization with a great deal of enthusiasm.

The last day they had a model staff meeting. There was a good deal said about staffs: how the hospitals should treat them, etc. The Evanston Hospital put on what they called a model staff meeting. The members came out and spread themselves around the stage and the presiding officer announced: "This meeting probably will be a little more harmonious than it ordinarily would be if we were

not on exhibition." It really was very much more harmonious than any staff meeting that I have ever attended. He called upon somebody to make a report; the report was made and it was adopted without any discussion. One man reported on the deaths and among them was one very badly-treated case. It was criticized and they came to the conclusion that he should be informed by the secretary that he would have to do better. Just what method they had of making it better I don't know.

They divided into business meetings and into scientific meetings. The business meetings were held at the University Club in Evanston; the scientific meetings were held at the hospital. The Board of Trustees were not invited to their business meetings, apparently; and they all recommended things for the consideration of the Board of Trustees.

Every year they have a social meeting; I thought that was a good idea. They invite their wives and they have a dinner and they have a very pleasant time at that social meeting. There are certain dues: the older men pay \$25 a year; the junior men pay \$20 a year. That money goes for paying for the dinners and also for maintaining the library. They have thirty current journals in the hospital. I think that is a mighty fine idea. The social meeting gets the doctors together in that way with their families, and the library provides proper medical literature for the internes and for the staff.

DR. O. W. YOERG: Dr. Kanel gave a very interesting and instructive clinic on surgery of the hand.

The first operation was performed on a man who some time previous had had a severe infection involving the index finger and with a resulting loss of the power of flexion of the finger. The operation was performed under local anesthesia. On incision it was found that a good deal of the tendon had sloughed out and new tendon was made by making incisions laterally through the scar tissue, conserving a band of scar tissue, which were allowed to remain attached to the distal and proximal ends to the tendon remaining. A flap of fat was loosened and brought under this constructed tendon. The scar tissue tendon was then shortened, so that the finger could be flexed to almost right angles at the metacarpophalangeal joint and the distal joints were held slightly flexed. This overcorrection he says was necessary to obtain full function. The wound was closed and the hand placed on a splint.

Dr. Kanel told of making new tendons with twisted strands of silk, interposing between the ends of the missing tendon, and adding to the strands of silk any scar tissue available. He laid stress on early motion in these cases, beginning in three or four days after operation and gradually increasing in amount. This early motion was demonstrated to him by a patient on whom he had done a similar operation, the making of a tendon for a thumb. She had been sent home with instructions not to use the thumb for at least six weeks, but on returning to see him six or eight weeks later perfect function had been restored. She stated that she had not followed his instruction and had used her hand playing a piano.

A second operation was done for suturing of a divided median nerve.

Cases showing late results of tendon making were shown and methods of tendon suture were outlined. A case of a boy who had been some time ago operated upon for webbed fingers was presented. The operation performed on this boy had been done by making a flap of the palmar surface of the web and bringing it back between the fingers and suturing the flap on the back of the hand.

Doing skin grafts on the exposed sides of the fingers. Dr. Kanavel told of his method of operating on cases for palmar infections, in which the flexor tendons were bound down, so that the fingers could not be flexed. He removes all the scar and a good deal of skin from palm of hand, loosens up the tendons from the underlying structures, brings the hand back and places it in a pocket, made by two horizontal incisions on the back. A separate flap of fat is made from the loosened skin of the back and this flap is slid underneath the tendons and the skin over them. The hand is kept sutured to this flap, which is attached above and below, and in about two and one-half weeks the flap is cut away from its upper and lower attachments and finally trimmed to fit the hand. Motion is started early.

DR. A. F. BRATRUD: Dr. Lespinasse at Wesley Hospital gave a demonstration of the results of the removal and transplantation of glands in chickens. It was very interesting from a scientific point of view only. In one case, there were two chickens. One had the typical appearance of an ordinary hen and the other had the typical appearance of a rooster. He made the statement that these two chickens were sisters at birth but that, in the one which appeared to be a rooster, the ovary had been removed and four testicles from other roosters had been transplanted shortly after hatching. The head and plumage was that of a rooster as well as the shape of the body. It even had fairly well developed spurs.

In another series of chickens he had been using roosters only for his experiments. Here he started by removing testicles—one-eighth at a time, until he had removed seven-eighths of the testicles. As the greater amounts were removed, the birds gradually changed in their physical development so that they approached to the shape of the head and body of the hen, i. e., the head approached the triangular shape head which is characteristic of the hen, and the bulky breast of the rooster gradually became smaller as is characteristic of the hen. There was very little change in the plumage in these cases.

From a practical point of view, I do not think it yet amounts to much but that it may have a future.

DR. S. R. MAXEINER: I am going to give you just the notes as I took them from Strauss's clinic. His first case was one of pyloric stenosis. He reported that he had done 384 operations for congenital pyloric stenosis with eight deaths. I do not know of any place elsewhere the same record has been made. He made several interesting statements which I jotted down. The first was that he was repeatedly called to the infants' home where he was on the staff, to operate a case of pyloric stenosis that had developed within the first week; but those were never true cases of pyloric stenosis. He said that in the history of his 384 cases there was not one exception where there was an

actual pyloric stenosis which developed before the tenth day. The average was between the tenth and the fourteenth day, and frequently the symptoms did not develop before the third week.

Pyloric stenosis, he states, is due to hypertrophy of the pyloric muscle. For instance, he compares it to the arm of the blacksmith who, constantly swinging a hammer, develops an enormous biceps. The pyloric muscle in these infants is constantly in a rhythmic, spasmodic contraction, and due to this rhythmic contraction it becomes extremely hypertrophied. That is what he calls a real, true hypertrophic stenosis.

He speaks of what is called the water test. These babies are placed upon the table, stripped, and the abdomen is inspected. Frequently in the normal child peristaltic waves are noticed in the stomach, but these are small rhythmic contractions. In the real pyloric stenosis case he gives a small amount of water from a bottle, and there immediately occurs a peristaltic contraction in the stomach; and because of the spasm of the pylorus, these waves are what he calls big waves, and are absolutely characteristic of these pyloric conditions. Then he follows this by a small amount of bismuth which is put into the stomach. The baby is turned from side to side, and then the stomach is emptied. There is no bismuth left in the stomach except what coats the sides. Then under the fluoroscope he demonstrates conclusively these same large waves that he sees through the abdominal wall.

He states that the amount of obstruction varies from 20 to 100 per cent. In cases of 100 per cent the procedure is obvious. Cases where there is less than 50 per cent retention in the stomach produce a normal stool; and as a result he does not believe that the stool is of any particular value in these cases. You may get a starvation stool in anything over 50 per cent retention. In cases where there is more than a 50 per cent retention, he says to operate immediately. He states that the cardinal points in diagnosis are this water test, with the visible peristaltic waves, projectile vomiting, and the interval of ten to fourteen days before the onset of symptoms. The palpation of the tumor is of no importance whatever. Emaciation depends entirely on the length of time and the amount of obstruction. All of his bad cases are preceded by a transfusion into the longitudinal sinus of 75 c.c. of blood; and frequently he gives 5 per cent glucose or salt solution also into the longitudinal sinus. When the operation is done on very bad cases, or the children show evidence of shock—that is, not exactly shock, but show the effect of the operation—he follows with another transfusion of 75 c.c. of blood.

The technic of his operation for pyloric stenosis is described in the system of surgery by Ochsner.

DR. JAMES A. JOHNSON: One of the interesting things I observed in A. J. Ochsner's clinic, during the meeting of the Clinical Congress in Chicago, was the experimental work done by Dr. Nuzum on the causation of cancer. Dr. Nuzum had isolated an anerobic organism from a human breast cancer. This organism he had cultured and injected repeatedly into the breasts of ten dogs. Finally one of the older dogs developed a cancer of the breast

which progressed to a fatal termination—the post-mortem showing extensive metastases into practically every organ. Dr. Nuzum had been quite enthusiastic about discovering the cause of cancer; and Dr. A. J. Ochsner, in one of his discussions of the subject, stated that he believed Dr. Nuzum's organism was the cause of cancer.

However, with further experimentation Dr. Nuzum has not been able to isolate his organism from the cancer, which he produced, and transplant it to other animals.

Dr. Nuzum now does not believe that the organism was the direct cause of the cancer, but that it was in all probability due to the constant irritation both mechanical and bacterial which he produced by the constant injection into the breast.

Dr. S. H. Baxter read a paper entitled, "Retroperitoneal Tumor." (See page 42.)

At the conclusion of the program all the members of the Society stood in silent tribute to the memory of Dr. Warren A. Dennis, of St. Paul, news of whose death had just been received.

PROGRESS

Abstracts to be submitted to Section Supervisors.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH
THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

THE CAUSE OF BOTHRIOCEPHALUS ANEMIA:

Russel L. Haden (Amer. Jour. Med. Sc.). The broad tapeworm is most commonly encountered in the Baltic provinces of Russia, the Scandinavian peninsula and certain parts of Switzerland, and is the most common tapeworm of China and Japan. The intermediate host is fish, and man is infected by eating raw or improperly cooked fish containing the cysticercus stage of the parasite. The case reports in the United States have not been very numerous, but the paucity may be partially due to lack of careful observation.

Unlike the secondary anaemia occurring in other parasitic infections, the picture of anaemic in bothriocephalus infections cannot be distinguished clinically from true idiopathic pernicious anaemia. The similarity in the clinical picture has excited interest among research workers, in the hope that a solution of the cause of anemia in bothriocephalus infections may throw some light on the cause of pernicious anemia. Attempts to reproduce the anemia with extracts from normal worm have not been successful. Schaumann and Tallquist found that by feeding or injecting subcutaneously dogs with worms which had been subjected to tryptic digestion, an anemia could be produced. Faust and Tallquist noted that the worms recovered from patients having anemia show a great deal of loss of substance—sometimes as much as 60 per cent per unit of length, as compared with the normal worm. The cause of this disintegration is not clear.

The author reports a case in which infestation had apparently occurred six years previous to coming to the United States from Finland, as he had passed segments of tapeworm at intervals for at least two years. The patient had developed rather sudden symptoms of anemia, and on recovery the worm was found with its segments densely intertwined and undergoing disintegration. Haden believes that this is corroborative of Tallquist's observation that worms recovered from patients with anemia show loss of substance, and that the onset of symptoms is due to the death of the worm and the anaemia due to the absorption of decomposition products. The condition of the patient improved promptly after the passage of the worm, and after sixteen days the red blood count had advanced from 2,000,000 to 3,673,000, and ova could no longer be found in the stools.

F. J. HIRSCHBOECK.

MECHANISM OF PRODUCTION OF BREATH SOUNDS: P. Martini (Arch. Int. Med., September 15, 1923). Just as on percussing the air-containing lung the specific sounds of the two naturally dependent and connected systems (chest wall and lung) determine the percussion sound, so the breath sound over the air-containing lung is composed of two specific sounds: that of the bronchial system and that of the air-containing lung tissue.

Only the sound of the chest is heard on percussion over a massively infiltrated lung, the lung itself remaining mute. The specific sound of the infiltrated lung has no part in the bronchial breathing heard over it. Pathologic bronchial breathing is the expression of correctly transmitted vibrations. During the respiration the air in the bronchi is caused to vibrate in the form of split and cut sounds. The glottis is not necessary for this purpose. The importance of the laws of forced vibrations in the problem of auscultation is stressed.

T. A. PEPPARD.

SURGERY

SUPERVISORS:

E. MENDELSSOHN JONES,
LOWRY BLDG., ST. PAUL
VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

THE RELATION OF RIGHT-SIDED ABDOMINAL PAIN TO RIGHT-SIDED DISEASE: R. C. Coffey (Jour. of the Amer. Med. Assn., September 15, 1923). Right-sided abdominal pain is often due to other causes than pathological conditions in the gall-bladder, head of the pancreas, right kidney, appendix, and right ovary.

A study of a class of cases described by Wilms, Klose and Lichty has convinced the author that a large percentage of the cases of chronic right-sided abdominal pain are the result of defective fixation of the ascending colon. This defective fixation is due to four degrees of defective fusion of the primitive mesentery of the colon in fetal life. The

second degree is where the colon has rotated as far as the kidney and has become attached to its anterior surface, leaving the ascending colon and cecum mobile. This group creates most of the trouble.

"Pain resulting from defective peritoneal fusion is directly produced in two ways: (1) by distention of a mobile prolapsed cecum, and (2) by traction on acquired membranes or bands which help to carry the weight of the organs below."

One case is described in detail and a description by Waugh is given. The characteristic features are (1) appearance of an absolutely irregular right-sided pain at the age of 20 or 25, (2) mild indigestion not affected by diet, bad habits, or unsuitable environment, (3) loss of weight and profound lassitude, and (4) general tissue wasting and degeneration in the later stages.

The author cites one case in which the following chain of pathological changes developed as a result of nonfixation of the right colon:

1. Nonfixation of the cecum and ascending colon.
2. High fixation of the appendix and its mesentery well up under the liver.
3. Fixation of the hepatic flexure to the front surface of the kidney, with acquired membranous development to strengthen the supports.
4. Acquired membranes attending from the parietal peritoneum across to the mobile colon.
5. Acquired membranes along the under surface of the first part of the transverse mesocolon for the extra support of this part of the colon.
6. One band extending along the omentum from the colon to the under surface of the gall-bladder.
7. Another extending from the colon across the duodenum making extra fixation.
8. A midline ptosis probably due to dilatation of the stomach, secondary to dilatation of the duodenum, which was produced by duodenal arteriomesenteric ileus.

"Forced feeding and fattening will relieve a certain number of these patients of their pain, but painful conditions of the right side of the abdomen are usually best treated by surgical measures, which usually consist of shortening the mesentery of the cecum and ascending colon and fixing it to the posterior lateral parietal peritoneum by interrupted sutures without actually sewing the intestinal wall. At the hepatic flexure the line of interrupted sutures is gradually brought forward on the lateral parietal peritoneum, picking up the mesentery of the colon, attaching it to the front wall until the beginning of the omentum is reached, when the omentum is attached to the anterior abdominal wall over as far as the midline and sometimes 3 or 4 inches beyond. If the cecum is extremely dilated, plication may be performed."

"At present I do not hesitate to operate for long continued annoying right sided pain with the positive assurance that in the majority of all cases I shall be able to relieve the pain whether it is due to organic lesions or to inorganic disease accompanying defective peritoneal fusion."

W. P. HERBST.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS

ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

UBER SCHWERE FORMEN VON ANAMIE BEI SEPTISCHEN ERKRANKUNGEN: Max Frank (Archiv für Kinderheilkunde, July 21, 1923). The author presents three cases of severe secondary anemia in infants.

In two of these positive blood cultures were present. One, a urinary infection, had bacilli coli in the blood stream. The other was a general infection resulting from multiple skin abscesses, and showed staphylococci in the organs at postmortem.

The third case was a generalized infection following a bronchitis in a poorly nourished infant. No positive blood or organ culture was demonstrated in this case.

All three patients showed a severe, rapidly developing anemia, with a color index less than one. Anisocytosis, poikilocytosis and polychromatophilia were present in all cases.

In those in whom positive cultures were found, the nucleated red blood corpuscles were diminished, the leucocyte counts were only slightly elevated, and the platelet counts were definitely reduced, as low as 7,400 per cu. mm.

On the other hand, in the third case, where a pyemia rather than a septicemia was present, the leucocyte count was markedly elevated, the nucleated red blood cells were numerous and the platelets were within normal limits. A few neutrophilic myelocytes and even myoblasts were seen.

The bone marrow in the cases of septicemia showed a definite diminution in the number of P.M.N. neutrophiles and giant cells. These elements of the bone marrow were normal in the case of pyemia.

Frank believes that in the cases of septicemia there is a hypoplasia of the bone marrow due to the action of bacterial toxins. This condition is not present in pyemias where one sees a normally reacting bone marrow.

H. S. LIPPMAN.

THE IODIN TREATMENT OF GOITER IN OLDER GIRLS: W. Silberschmidt (Schweizerische Medizinische Wochensh, Basel, July 1923). Silberschmidt reports the result of the systematic administration of iodine tablets to girls ranging from 15 to 22 years of age. From two years' observation he concludes that this treatment is borne well, is harmless, and that many pronounced goiters retrogress. The beneficial results apparently are more marked in individuals having soft, than in those having hard goiters. He states also, that the iodine treatment is undoubtedly more promising for children than for adults. Goiters having connective tissue infiltration are not likely to show much benefit from the administration of iodine tablets or iodized salt.

C. A. STEWART.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

THE DIETARY OF HEALTH AND DISEASE. Gertrude I. Thomas, Instructor in Dietetics, University of Minnesota. 210 pages. Illustrated. Philadelphia and New York: Lea & Febiger, 1923. Cloth, \$2.25.

MODERN ASPECTS OF THE CIRCULATION IN HEALTH AND DISEASE. Carl J. Wiggers, M.D., Professor of Physiology in the School of Medicine, Western Reserve University, Cleveland. 2d edition, revised. 662 pages. Illustrated with 204 engravings. Philadelphia and New York: Lea & Febiger, 1923. Cloth, \$7.50.

A MANUAL OF PROCTOLOGY. T. Chittenden Hill, Ph.B., M.D., F.R.C.S., Instructor of Proctology, Harvard Graduate School of Medicine; Surgeon to Rectal Department, Boston Dispensary; Ex-President American Proctologic Society. 279 pages. Illustrated with 84 engravings. Philadelphia and New York: Lea & Febiger, 1923. Cloth, \$3.25.

DISEASES OF THE SKIN. Frank Crozer Knowles, M.D., Professor of Dermatology, Jefferson Medical College, Lieutenant-Colonel Medical Reserve Corps, U. S. A.; Dermatologist of the Philadelphia General, the Presbyterian, the Children's and the Babies' Hospitals; Chief of Clinic, Dermatological Department, Pennsylvania Hospital, etc. 2d edition, revised. 595 pages. 229 illustrations and 14 plates. Philadelphia and New York: Lea & Febiger, 1923. Cloth, \$6.50.

THE TREATMENT OF DIABETES MELLITUS. Elliott P. Joslin, M.D. (Harvard), M.A. (Yale); Clinical Professor of Medicine, Harvard Medical School; Consulting Physician, Boston City Hospital; Physician to New England Deaconess Hospital. 3d edition, revised and enlarged. 784 pages. Illustrated. Philadelphia & New York: Lea & Febiger, 1923. Cloth, \$8.00.

RHUS DERMATITIS (Poison Ivy): Its Pathology and Chemotherapy. James B. McNair, University of Chicago. 298 pages. 15 illustrations. 3 plates. University of Chicago Press, 1923.

DIATHERMY AND ITS APPLICATION TO PNEUMONIA. Harry Eaton Stewart, M.D., attending specialist in physio-

therapy, U. S. Marine Hospitals, New York; consultant in physiotherapy, U. S. V. B. Hospital, New Haven, Conn.; director New Haven School of Physiotherapy; formerly assistant director, Section of Physiotherapy, Office of the Surgeon General, U. S. Army, and Supervisor of Physiotherapy, Bureau of U. S. Public Health Service, Washington, D. C. 210 pages. New York: Paul B. Hoeber, Inc., 1923. Cloth, \$3.00.

THE TREATMENT OF DIABETES MELLITUS WITH OBSERVATIONS BASED UPON THREE THOUSAND CASES. Elliott P. Joslin, M.D. (Harvard), M.A. (Yale). Third edition, enlarged, revised and rewritten. Lea & Febiger. Price, \$8.00.

This edition contains many new sections. The sections of insulin, pathology, respiratory metabolism, levulose, duodenal ulcer and diabetes of twenty years' standing have appeared for the first time. Marsh and Newburgh methods of treating diabetes are also very clearly and impartially discussed. Much room is given to the discussion of the modern conceptions of acidosis. While the second edition contains numerous tables, the third has many additional ones. Among the more important are the tables of diabetic and non-diabetic foods by Dr. E. M. Bailey and the tables for predicting the metabolism by Harris and Benedict. Numerous parts here and there through the entire book have been either supplemented or somewhat changed due to the introduction of insulin treatment and the acquisition of a more exact knowledge based on numerous experiments and observations during the last decade. The section on surgery has been entirely rewritten.

The work has no equal. Its growth has been phenomenal. Six years ago the author based his treatment on thirteen hundred cases. His treatment of diabetes now is based on three thousand cases. "To Banting and Best and the Toronto Group of Insulin Workers" is dedicated this masterly production. This same spirit which prompted the author to dedicate his work to the above men characterizes also the impartial discussion of any contribution, regardless of how insignificant its source may have been, to the better understanding of diabetes. No one attempting to treat diabetes can be without this work.

J. A. LEPAK, M.D.

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ORIGINAL ARTICLES

THE CLINICAL SIGNIFICANCE OF PAIN IN THE AREA SUPPLIED BY THE FIFTH CRANIAL NERVE*

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It is very difficult to estimate pain as a part of a patient's complaint, since it is relative and varies with sex, race and temperament. Pain cannot be seen, felt, nor measured directly by the examining physician; he has only the patient's word, and his reaction to stimuli. Pain is usually regarded as an index of existing disease, and its cause is diligently sought so that cure may be effected. The ease with which this objective is reached often depends on the associated signs and symptoms discernible at the time. If these companion symptoms are lacking, the difficulty of interpreting pain on its own merits becomes exceedingly great, more especially if it is inconstant in degree, type and location, and corresponds to no familiar sign of disease. When pain assumes certain characteristics and occupies a certain location, in a combination which is familiar, having occurred in patients throughout the ages, it may be classified as a distinct disease entity, even though its cause remains completely unknown. For example, there is no general agreement with regard to the pathologic lesion of paroxysmal trigeminal neuralgia, but its manifestations are so definite and invariable from patient to patient and from time to time, that without clinical signs or objective findings, a diagnosis is made with comparative ease. The patient's story alone is sufficient to make the diagnosis, and this story remains the same, irrespective of sex, race or temperament. If, however, there is pain in the area usually affected by paroxysmal, trigeminal neuralgia, but not of the type characteristic of that disease, the difficulty of diagnosis is

great, since there may be no objective findings to indicate the cause or nature of the pain. Paroxysmal trigeminal neuralgia is included in our classification of disease, since it does not vary in its manifestations, even though they consist merely of pain. However, any unusual pang, unsupported by clinical findings, may not have a name under which it may rest complacently in a pigeon-hole of our classification of disease.

With the more recent means of alleviating permanently the suffering caused by paroxysmal trigeminal neuralgia, physicians are eager to separate from the vast multitude of patients with hitherto unclassified pains, aches, and algias, those having a disease which they can cure. This is comparatively easy, since the manifestations of paroxysmal trigeminal neuralgia are well known, and it has been satisfactorily settled that there is only one true type of the disease for which there is appropriate and satisfactory treatment. It has also been established that the application of this treatment to any disease that is not true paroxysmal trigeminal neuralgia brings disaster, the final state being worse than the original disease.

INDEFINITE NEURALGIAS

The question arises: What constitutes the classification, etiology and treatment of all the other pains and aches in the fifth nerve area wherein all obvious causes have been carefully eliminated, and what are these pains? The use of the word "neuralgia" means nothing more than that there is pain in the area supplied by a certain nerve, and like charity this name covers a multitude of sins of ignorance.

In a large clinic a certain number of patients complaining of pain in the fifth nerve area are referred to the neurologist, after the internist, dentist, ophthalmologist and rhinologist are satisfied that they cannot find the cause of the pain. On the neurologist, therefore, is thrown the responsibility of claiming that the pain occurs in a disease in his own field of study. The responsibility in such cases becomes heavier when a routine neurologic

*Read before the Minnesota State Medical Association, October 10-12, 1923, St. Paul.

examination reveals no disturbed function. I shall discuss here only these cases in which pain is the sole complaint, with few or no clinical findings, and not attempt to go into all the causes of pain in the area supplied by the fifth nerve.

LESIONS AFFECTING THE FIFTH NERVE

TABLE 1

PAIN IN THE FIFTH NERVE AREA DUE TO INVOLVEMENT OF THE NERVE AND ITS CENTRAL CONNECTIONS

Peripheral lesions: (1) trauma, scar tissue formation and pressure by bone fragments, (2) inflammation of nerve endings due to local septic processes (peripheral neuritis), and (3) chronic paroxysmal trigeminal neuralgia (?).

Lesions involving nerve trunks: (1) trauma to bony canals, or hemorrhage around nerve trunk and scar formation, (2) tumor formation pressing on nerve (nasopharyngeal malignancy), and (3) local septic processes (interstitial or parenchymatous neuritis).

Lesions of posterior root ganglia or posterior roots: (1) ganglionitis, posterior poliomyelitis or herpes trigeminus, (2) tumors arising from ganglion envelopes or arising elsewhere and compressing it, (3) local meningitis, syphilitic or nonspecific epidemic encephalitis, and (4) tabes dorsalis.

Lesions of the brain stem: (1) tumor in the pons, (2) thrombosis or hemorrhage of the posterior inferior cerebellar artery, (3) multiple sclerosis, and (4) arteriosclerotic softening (?).

Lesions in the optic thalamus.

Lesions in higher associative brain centers: (1) hysteria—"psychalgia."

Migraine.

Considered anatomically, the fifth nerve may be affected at the periphery, along its extracranial course, or inside the skull. It may be damaged at the ganglion, in the posterior root, or at the termination of the root in the brain stem. It is worth while to review the more familiar lesions affecting the nerve, including only those that involve the nerve itself or its branches, omitting the more numerous cases of pain due to disease of organs supplied by this nerve, or pain referred along the course of the nerve from diseased organs situated at a distance from it. In many cases the diagnosis is easily made because there are so many more factors in the history and findings than mere pain. But only cases have been selected for discussion here in which interest lies in the unusual circumstance surrounding the onset of pain, or in which the diagnosis was difficult on account of the sparsity of clinical signs.

Herpes and post-herpetic pain in the area supplied by the fifth nerve is common enough, especially when it involves, as is usual, the first divi-

sional area alone. In elderly patients, this herpes ophthalmicus is likely to be followed by an intractable type of pain, but the diagnosis is usually easy since the history of vesicles with the residual skin and corneal scars is readily demonstrated. However, the scars may be few, and hidden by the hair on the scalp, and the history of the eruption be confused by a wrong diagnosis, such as erysipelas, at the time of the acute attack. The pain, however, is burning and numb, which distinguishes it from other pain, and its association with hyperesthesia, anesthesia and paresthesia in various parts of the area involved is typical. Herpes is less commonly found in a second divisional area. In Case 1 herpes represented part of a local meningo-encephalitis.

EPIDEMIC MENINGO-ENCEPHALITIS, HERPES TRIGEMINUS, RESIDUAL FACIAL PAIN

Case 1 (A416932). Mr. L. T., aged thirty-one years, complained chiefly of pain in the left temporal region. Eight weeks before, he had had a mild respiratory infection which had passed off in three days. Six weeks before, he had had marked diplopia which lasted about two days, followed by severe lancinating pains in the whole left side of the body, except the face. Jerking lightning-like pains radiated chiefly down the left upper and lower limbs, lasting four days, and accompanied by malaise and nocturnal delirium. Following these attacks, severe pain occurred in the left side of the face, occupying three divisional areas of the fifth nerve. This was at first sudden, severe and darting, like red-hot needles being thrust into the tissues. Later it was superseded by steady aching in the left temporal area, and numbness over the left side of the nose and left cheek. Blisters appeared over this area about three days after its onset. They became purulent and formed a raised, red, swollen patch in the left temporal area, which was incised, with evacuation of pus. Pain, steady, throbbing and burning, had persisted, chiefly in the left temporal area, but at times spreading to the cheek and lower lip.

Examination revealed scars of former herpes over the temporal area, and a moderate diminution of sensation to pain stimulation over the same area, cheek and nose. The corneal reflex was absent on the left. Examination of the spinal fluid revealed 14 lymphocytes for each cubic millimeter, and a negative Wassermann reaction. This patient was ambulant and appeared fairly well except for his very distressing and constant pain. The high lymphocyte count in the spinal fluid showed that he was not completely over the active stage of the trouble at the time of the examination.

It is well known that the pain in migraine attacks may be localized to one small area, but when it appears in some portion of the distribution of the fifth nerve, there may be difficulty in diagnosis. A person may suffer from typical migraine attacks from puberty to the fifth decade, and then, instead

of the attacks diminishing in frequency and severity, and finally disappearing, as is usual, the form of the disease may change and the pain appear in a relatively small area supplied by the fifth nerve, such as the so-called migrainous neuralgia or neuralgic migraine. The pain may appear in the supra-orbital region, the eyeball, the cheek, or in the jaws, or in the whole side of the face. More commonly it is felt in and around the orbit. The pain may be severe and frequent, or it may last for many days. The diagnosis is made from the previous history of ordinary migraine headache, from the familial history, and from the associated scotoma, nausea, and constitutional disturbance observed in ordinary types of the disease. The steady, continuous character of the pain without stimuli, such as touching or washing the face, is enough to distinguish it from paroxysmal trigeminal neuralgia.

Harris, in a recent paper on causes of persistent pain in the central nervous system, brings up the familiar term supra-orbital neuralgia, only to dismiss it, saying that the vast majority of patients having a disease thus designated were really suffering from migraine. In earlier articles, however, there are many references to what is called supra-orbital neuralgia. Putnam, in 1896, discussed the subject in an exhaustive article, mentioning the close association of "supra-orbital neuralgia" with ophthalmic migraine. Under this term he described a disease characterized by (1) a premonitory sense of depression the day before an attack; (2) boring, deep-seated or painfully pulsating pain localized to one spot, such as the eyeball, eyebrow or forehead, and associated in severe attacks with vomiting; (3) scotomas, lacrimation, congestion of conjunctiva, and change in the size of the pupils, and (4) a remarkably regular, intermittent course with attacks occurring daily for several weeks, usually at 8:00 or 9:00 a.m., and lasting five or six hours, and appearing more often in the winter and fall. Putnam discovered a familial tendency in most of his cases with a preceding history of periodic hemi-crania or generalized headaches. He admits the similarity between this disease, "supra-orbital neuralgia," and neuralgic migraine. He divides his cases into three types: (1) those in which no migrainoid or other special neuropathic tendency is traceable, (2) those in which other members of the family have had the same form of migrainoid neuralgia with perhaps a touch of true migraine, and (3) those in which the patient's attacks and

those of other members of the family approach very nearly a true migraine type. Putnam, therefore, showed the resemblance of "supra-orbital neuralgia" to migraine neuralgia to be so close that one wonders whether there is any essential difference between the two conditions. Considering all the cases of supra-orbital pain, and including those due to migraine, frontal sinus disease and ocular disturbances, and such general constitutional diseases as malaria and influenza, there seems to be little left to be called supra-orbital neuralgia. The term could be used only in the few cases remaining after the foregoing causes had been eliminated. The gradual emergence of migraine headaches into migraine neuralgia during the fourth and fifth decade is demonstrated in Case 2.

NEURALGIC MIGRAINE UNRELIEVED BY MULTIPLE SINUS OPERATIONS AND SECTION OF THE POSTERIOR ROOT OF THE FIFTH NERVE

Case 2 (A442549). Mr. A. D. R., aged fifty-four years, came to the Clinic October 1, 1923, complaining of pain in the right side of the face. His mother had had severe sick headaches all her life and the patient himself, from the age of twenty, had suffered from frontal and occipital headaches about once a week, usually beginning in the morning and lasting twenty-four hours. These were not associated with scotoma or vomiting, but there was definite nausea during the attack. Four years before, the headaches had become more severe and frequent, gradually becoming localized to the right supra-orbital ridge and behind the right eyeball. This pain seemed to replace his former headaches. He had had a submucous resection elsewhere to relieve the supra-orbital pain, but it was made worse. Six other operations were performed on the nasal sinuses of the right side, but he became worse after each operation, and in May, 1923, it was present both day and night. On this date he had had a resection of the posterior root of the right fifth nerve. The surgeon reported finding a thickened dura over the ganglion. Immediately after operation the patient had the sensation of his teeth being crowded, and the numbness usual after section of the posterior root of the fifth nerve. These sensations accompanied the pain in the right supra-orbital region, which remained the same, or was even more severe. In a month it had spread over the whole fifth nerve area.

At the time of his visit to the Clinic he complained of severe, continuous, prickling, bursting pain in the right side of the face. He said that he felt as if his scalp was being torn off and his skull crushed in. Every time he mentioned the sensation he had a new adjective for it. Pain in the left side of the mouth and alveolar margin was infrequent. Morphine had been taken to induce sleep. The patient considered his condition worse in every way than ever before. He was unkempt, irritable, and emotional, and looked the picture of utter misery. There was complete cessation of function in the right fifth nerve with abolition of sensation and motor power.

Case 2 also demonstrates the disastrous results

of surgical intervention. In cases in which operation has been performed, a state of chronic exhaustion, and nervous and emotional instability seem to result, and the original complaint is obliterated by the manifold and bizarre symptoms which increase with each operation. It is strangely true that patients with paroxysmal trigeminal neuralgia submit readily to radical operations for resection of the ganglion or section of the root, and regard the discomforts of the resultant anesthesia of the face, jaws and scalp as of minor consequence. They are ready to recognize freedom from pain and be thankful for it. They are not usually neurotic, and, as Patrick has observed, are seldom addicts of opium. Usually during paroxysms they are too busy to complain, and between their paroxysms, during remission, or after operation, too thankful to be free from pain, to indulge in any elaboration of symptoms or display of emotion. This is not true of the patients with migraine. After surgical intervention, as in Case 2, they become mental and physical wrecks, actual psychosis often developing. Something fundamentally different in the mental make-up of the two types of patients, rather than in their actual complaints, is suggested, since such different and contrasting results are obtained by surgical treatment. Migrainous neuralgia may co-exist with true paroxysmal trigeminal neuralgia, and the combination is a very confusing picture (Case 3).

ASSOCIATION OF MIGRAINE NEURALGIA WITH TRIGEMINAL
NEURALGIA. DISAPPEARANCE OF MIGRAINE NEURALGIA
AT THE MENOPAUSE. CURE OF TRIGEMINAL NEURAL-
GIA BY CUTTING THE POSTERIOR ROOT OF
THE FIFTH NERVE

Case 3 (A407163). Mrs. W. M. C., aged fifty-three years, came to the Clinic in October, 1922. She had had pain in the right side of the face for twenty-two years. Her twin sister had been similarly affected. The pain was dull and steady in the region of the right angle of the mouth, right side of the nose, right orbit and right side of the forehead. It came usually with menses, lasted thirty-six hours, and was associated with nausea and scotoma. The pain was relieved by sleep and quiet, and finally disappeared at the menopause two years before. The patient complained of another type of pain of twelve years' duration which was sudden, shock-like, and came in repeated paroxysms of a few seconds each. Talking, laughing, washing or touching the face brought on paroxysm. The pain radiated from the right angle of the mouth to the right orbit, and was relieved by alcohol injections and avulsion of the fifth nerve branches. The pain had continued after the menopause. The patient had had five years of relief from this sudden transitory pain by avulsion of the infra-orbital and supra-orbital nerves. The older, steady, periodic pain,

however, was not relieved by this or by alcoholic injections, but occurred regularly and periodically with the other type of pain until it ceased at the menopause, and left the trigeminal neuralgia to be relieved by operation.

Dana, in 1900, recognized the association of migraine with paroxysmal trigeminal neuralgia, and was even under the impression that a person with migraine may have attacks of paroxysmal neuralgia following a long period of migraine. He divided neuralgic cases into two groups. *Group 1* comprised the migrainous type of early life, and probably represents an evolution of true paroxysmal neuralgia on the basis of a migrainous neurosis. The majority of his patients in this group were women, many of whom suffered from the diffuse and steady pains of migraine with paroxysmal neuralgia. He discovered that they were made worse by operation, and explained this by the assumption that the disease did not lie exclusively in the trigeminal nerve. It is a question whether some of the cases were paroxysmal trigeminal neuralgia, or neuralgic migraine. However, from the description, Case 3 would represent this type, except that temporary relief was obtained by alcohol injection, and final and permanent cure of the paroxysmal neuralgia by root resection. *Group 2*—In the second type the patients developed paroxysmal neuralgia late in life without associated migraine, and the majority were males.

Many other cases from the Mayo Clinic could be quoted, showing the frequent association of migraine and trigeminal neuralgia. Patrick demonstrated that a high percentage of his patients with trigeminal neuralgia had suffered from migraine. Of 200 patients, forty had migraine. The diseases, however, seem to be two entities, readily differentiated and having a correspondingly different form of treatment.

Recently acquired pain in the fifth nerve area brings up the possibility of involvement of the nerve ganglion or the posterior root by a tumor. The much quoted case of Weisenburg of a patient who had had multiple operations for supposed trigeminal neuralgia, and who died of a tumor in the cerebellopontile angle, is an example. Even with our recent knowledge of the distinct character of paroxysmal trigeminal neuralgia, such a mistake is just as likely to be made now. Cushing has divided such tumors into four groups: (1) tumors in the cerebellopontile angle involving the root or ganglion of the fifth nerve by a process of extension, (2) tumors involving the gasserian ganglion

by pressure from above, (3) tumors arising in the pterygoid fossa and pressing on the second division of the fifth nerve, and (4) tumors arising primarily from the dural sheath around the ganglion.

Severe, steady, paroxysmal pain, lasting from thirty minutes to a few hours, may be the only symptom for many months before suspicion is aroused as to its cause. The pain is usually worse at night, is deep in the tissue, and is not relieved by ordinary mild analgesics. There is seldom any local deep tenderness but often superficial hyperesthesia. Other symptoms, such as numbness and diplopia, sooner or later appear, and the earliest and most striking finding is the loss of corneal reflex on the same side as the tumor. In Case 4 diagnosis was especially difficult, since there were many social and domestic irregularities in the life of the patient, suggesting conversion hysteria rather than pain from so formidable a disease as tumor in the gasserian ganglion.

TUMOR IN THE GASSERIAN GANGLION WITH PAIN IN THE FACE, AN EARLY AND ISOLATED SYMPTOM

Case 4 (A431889). Mrs. T. N. F., aged twenty-seven years, had developed severe paroxysmal pain over the right supra-orbital region twelve weeks before, lasting two hours night or day. Gradually this shifted to a spot just in front of the vertex in the middle line of the scalp, which became tender to the touch; the patient was unable to comb her hair. She had a sensation in the right eyelids, as if they were being drawn toward the nose. Six weeks before, three teeth had been pulled under local anesthetic. The sensation produced by the anesthetic seemed to persist, as a constant numbness over the right cheek developed, and pain was unrelieved. The maxillary and sphenoidal sinuses were opened and drained without relief; pain over the scalp increased in severity, disturbing sleep and rest. It was worse at night when lying recumbent, and least troublesome in the forenoon. It was always intermittent, lasting ten minutes at a time, but was severe during the paroxysm.

During the patient's stay at the Clinic numbness increased in intensity, and the area finally involved the whole right fifth nerve. The lips on the right side felt stiff and swollen, and the teeth on the right felt extra long, and there was an itching, tingling, burning feeling on the right side of the nose. Neurologic examination July 12, 1923, revealed nothing definite except subjective numbness over the right cheek. July 18, 1923, the corneal reflex on the right was slightly diminished, and pin prick was not as keenly felt on the right cheek. July 30, the corneal reflex was absent, and the masseter, temporal and pterygoid muscles were weak on the right side. There was definite anesthesia to pain over the right cheek; thermal and tactile sensibilities were less affected. The right eyeball was prominent, the right external rectus weak, and the right pupil large, and reaction on the same side was sluggish, with weakness of accommodation.

Operation was performed August 6, and a neurofibroma

(?), involving the right gasserian ganglion and its envelopes, was found.

The earliest symptom in this case was pain in the supra-orbital area, later more persistent in the scalp, near the vertex. The situation made the observer more suspicious of a functional complaint. Viewed, however, as an organic disease, this suggested a lesion, primarily of the first division of the fifth nerve, before its division into its three terminal branches. Localization of the tumor to the middle fossa of the skull seemed, therefore, reasonable. With pain in the cheek or upper lip and teeth it is more difficult to localize the tumor since it may be either inside or outside the skull. Nasopharyngeal malignancy, described by Woltman and New, commonly attacks the second or third division in the pterygo-maxillary fissure or pterygoid fossa, and also erodes the base of the skull, involving the fifth and possibly the sixth nerve inside the cranium. In such an instance, the lesion being both intracranial and extracranial, surgical intervention offers no possibility of relief. Therefore, pain, due to tumor, starting in the second or third divisional area, has a more gloomy prognosis than pain starting in the area supplied by the first division of the fifth nerve. The nasopharynx should be very carefully examined for an intrinsic tumor of that region, or for one bulging into the cavity from an extrinsic source when a patient is suffering from unexplained facial pain.

Pain in the jaws of elderly patients is a common and most distressing feature in a period of life that should be calm and peaceful. Usually, such patients have lost all their teeth and the pain is located by them in a small area of edentulous gum. Such neuralgia is well known; Oppenheim mentions it and also a senile or arteriosclerotic neuralgia occupying principally the trigeminal area in elderly patients. It is believed to be due to compression of the terminal filaments of the fifth nerve by hardened shrunken bone, and removal of the affected alveolus is supposed to relieve the suffering completely. Such patients are not usually referred to the neurologist. Many patients more than sixty years of age have had multiple operations on a certain relatively small area of the alveolus without relief. They describe their sensations as a burning, tingling, drawing, pulling, pressing or boring. The particular sensation is described with many gestures and with great feeling. In the quavering, high pitched voice of senility there is poured forth a flood of vituperation on the alleged

clumsy operators who in vain incised, scraped and injected the area which revealed nothing unusual on inspection, beyond previous intervention by all the methods known. The sensation is constant day and night, destroying sleep, rest, and mental equilibrium. Also, these patients sometimes complain of burning, prickling sensations in the tongue, numbness in the lips, and crawling sensations around the teeth, although usually their particular complaint is confined to one small area at a time. There is a strong suspicion that many of these patients owe their complaint to vascular insufficiency in the ganglion or brain stem. Perhaps, also, the sensation may be part of a senile, mental disturbance. Certain disturbances may originate in a mild pain or paresthesia and ultimately reach the state of a somatic delusion in an actual psychosis (Case 5).

THE SOMATIC DELUSIONS OF SENILITY

Case 5 (A250824). Mrs. J. W., aged fifty-nine years, came to the Clinic November 13, 1918, complaining of a drawing, pulling sensation in the right upper alveolus. Twelve months before, she had developed a steady ache in the right upper incisors. These were extracted, without relief, and she was given three alcohol injections into the infra-orbital nerve, also without relief. The portion of the alveolus corresponding to the pain area was then resected and immediately a pulling, drawing, tightening sensation replaced the previous pain. The patient had attacks of unconsciousness, followed by rigidity and sleep. Four months before, the infra-orbital nerve had been avulsed without changing the condition, and a second attack on the nerve produced no beneficial effect.

Examination revealed a much scarred alveolus and an area of anesthesia corresponding to the infra-orbital nerve avulsion. A diagnosis was made of psychalgia, but the true nature of the complaint was not determined. The patient returned a year later and a residual granuloma on the left upper alveolus was removed, resulting in an increase of symptoms. Her complaints became louder and more persistent day and night, of the unpleasant sensation on the right side of her upper jaw. One month later she again returned, and said that a bug the size of a bean was living in the tissues of her right upper gum. Every operation had secured a piece of it, but no one had found the head of the creature, so that it was always able to grow again. She feared that it might leave her gum, descend to her stomach and devour her entrails. Everyone had done their best, but no one had found the head of the devouring insect.

Senility was rather premature in this patient, and the real nature of her complaint remained long unrecognized, partly on this account and partly on account of her faulty knowledge of the English language. When she actually developed a delusion is not known, but we made no further parasiticide attempts.

The diagnosis of hysterical pain is always made with hesitation, and it should be made on stronger grounds than the absence of definite and visible pathologic findings. In certain cases, however, certain features of the pain, when considered in connection with the personality and the social life of the patient, suggest that a cause for the pain may be maladjustment of the higher psychic mechanisms. Emotionally unstable, at war with themselves and the world, such patients produce symptoms that are the outward manifestations of this inward struggle. As Gordon and Carleton have recently suggested, strong suggestion combined with internal and unresolved conflict in a predisposed ill-balanced person can be the exciting factor in producing almost any form of pain or ache. Usually a review of the personality of the patient, the life history and the reaction to environment, gives the clue to the actual mechanism of pain production. The pain frequently varies with factors tinged with a high degree of emotionalism in the daily life. Often, however, pain in such cases is more constant than in actual somatic diseases. The pain of organic disease is usually intermittent, but suspicion should be directed to pain present constantly day and night, never worse and never better. Often the patient confesses that the "pain" is not so much pain as a peculiar, distressing, ill-localized and deep-seated sensation (Case 6).

HYSTERICAL PAIN IN THE RIGHT CHEEK

Case 6 (A382189). Mrs. F. W., aged thirty-four years, came to the Clinic January 28, 1922, for relief from pain in the right cheek. The first attack had come on seven years before, at 4:00 a. m., lasting until 11:00 a. m. Thereafter it had appeared at intervals of a month to a week, necessitating rest in bed until noon, with breakfast in bed. She described it as a steady, severe pain commencing in front of the right ear and radiating into the right eye and into the right temporal region. Pain was absent during the day and on occasions when she was away from home, free from work and responsibility. Close questioning elicited the information that the pain always followed coitus. She had been sexually frigid during her entire married life, and only yielded from a sense of duty. When her husband was away from home the pain ceased. She herself did not realize this association, but believed that disease of her pelvic organs caused the pain, and came to the Clinic primarily for pelvic operation. She was emotionally unstable, excitable and voluble, and was disappointed because no attention was directed toward her imagined pelvic disease, and no suggestions made with regard to the removal of her reproductive organs.

Many hours of careful examination were required in this case to elicit the true story. The factors associated with the pain were submerged, and

the patient herself regarded them as of small consequence and only at the last moment mentioned her distressing marital relationship. The desired gynecologic operation of castration or hysterectomy probably represented a wish centered around relief from all sexual contact. The pain itself acted as an excuse and a solution of her conflict. The patient left the Clinic hurriedly as soon as she found operation was not advised, and, unfortunately, further observation was impossible.

Hysteria may be a reaction throughout life or it may occur in certain phases of existence, dependent on stresses and strains. There are, however, persons whose mental endowment is poor, and in whom a certain rôle seems necessary for the satisfactory working of their cosmos. The evidence of maladaptation may appear in small and trifling tics and mannerisms, or be severe enough to necessitate the assumption of a life of chronic physical and social invalidism. Such persons are either hypochondriacs or mendicants, who fill hospitals and workhouses. The enumeration of their lifelong sufferings with the various ill-advised procedures used to relieve them is to them an engrossing occupation. Sometimes they write their autobiography, and are as proud of relating the vicissitudes of their career as Job was to detail his misfortunes. Always they end with the remark that no one has cured them, and offer their latest medical counselor the opportunity to perform a miracle and change their whole life pattern. Case 7 is an example of our error in attempting to change a situation developed from heredity, and persisting throughout life.

MULTIPLE OPERATIONS ON THE RIGHT SIDE OF THE FACE, TWO
INTRACRANIAL OPERATIONS ON THE FIFTH NERVE
AND PERSISTENCE OF SYMPTOMS

Case 7 (A265657). Mr. C. J. P., aged fifty-four years, came to the Clinic April 10, 1923, complaining of pain in the right cheek of twelve years' duration. The onset occurred with the extraction of the right upper bicuspid tooth. The attacks of pain lasted from two to fourteen days every three months. Eight years before, a diagnosis had been made of sarcoma of the right antrum. Radium had been applied without relief. Five years before, the antrum had been opened and no pus found; however, within two weeks after operation there was a profuse amount of pus, and two operations were necessary to clear up the wound; the pain persisted. Four years before, he had been examined at the Clinic for the first time. He was nervous, and had pains all over his body and face. He had contracted gonorrhea which was not severe, but he had lost 15 pounds worrying about it, and most of his attention at that time was concentrated on his genitalia, and vague and peculiar symptoms. A diagnosis of "sexual neurosis" was

made at that time; the facial pain did not seem to be the dominant factor. Two and one-half years before, the pain had spread from the alveolus to the superficial tissues of the cheek, and avulsion of the right infra-orbital nerve had been performed, producing an area of corresponding anesthesia, but without relief. Several months later he had had three alcohol injections into the infra-orbital foramen, without relief, and an attempt was made to cut the posterior root. This failed since the sensory division remained intact, but the motor root was cut, with paralysis of the masseter, temporal and pterygoid muscles. Eighteen months before, the pain had spread to the right half of the soft palate, the region of the right nasolabial fold and right angle of the mouth. He had the whole anterior wall of the right antrum removed without relief. A year before coming to the Clinic, and for the first time, he developed sudden, severe, sharp pains lasting five to thirty seconds and initiated by external stimuli, such as washing his face, eating and speaking. His previous pains had been of a drawing, pulling nature. There was a definite trigger area over the right angle of the mouth. He had become depressed, sleepless and morose.

Examination revealed an extraordinary degree of mutilation over the right cheek with a depressed area over the antrum, the scar of radium burn and the patch of anesthesia produced by section of the infra-orbital nerve. There was no other anesthesia, but the right masticatory muscles were paralyzed, all being signs of operations performed elsewhere. The posterior root was sectioned to relieve more recent pains, which he declared were worse than the original pain. There was immediate cessation of the shooting, sudden pains, but he complained just as bitterly of a grinding, pressing, drawing sensation over the right cheek.

This patient's life history and his constitutional make-up were sufficient to stamp him a biologic inferior. Recent correspondence contains long rambling complaints of pain worse than before, and philosophic discussions of his misery and suffering. It is possible that this patient and others of the same type terminate in state hospitals with a psychosis of which the earliest signs were present at birth.

The pain of angina pectoris may be referred to various zones of the trunk and extremities. Willius has described unusual locations for this pain, but rarely is one tempted to assume that pain in the upper and lower jaws belongs in this category (Case 8).

ANGINA PECTORIS REFERRED TO THE RIGHT SIDE OF JAWS

Case 8 (A311057). Mr. O. R., aged seventy-three years, came to the Clinic April 9, 1920, complaining of paroxysmal pain in the right upper and lower jaws, that came on once or twice a day, usually when he walked up hill just after breakfast. Excitement, anger or hard physical exertion always precipitated the attacks, which lasted about thirty minutes. The pain was steady, severe and reached a maximal severity with rapid diminution at the end of the attack.

Alcohol injections of the infra-orbital and inferior dental nerves had been given without relief.

Examination revealed marked arteriosclerosis and myocardial degeneration. Electrocardiograms revealed arborization block, and roentgenograms, marked enlargement of the heart to the left. The pain continued until the patient died three years later. He was relieved temporarily by amyl nitrite inhalations; deep alcohol injections of the fifth nerve did not relieve him. During the last year of his life the attacks of pain radiated down the left arm. He died, apparently from cardiac failure.

The diagnosis in this case was made on the definite association of pain, exercise, emotions and the usual factors bringing on an anginal attack. Clinical investigation revealed enough cardiovascular disease to substantiate this assumption, and the relief produced by amyl nitrite inhalations further substantiates such a diagnosis. At the time the patient was examined at the Clinic the pain did not radiate down the arm, but it did later. The patient eventually died of cardiac insufficiency.

These are only a few of the cases of pain in the fifth nerve area, and they represent but a small part of the problem of diagnosis. There remain a large number of case records in our files in which no satisfactory diagnosis could be made, of which Case 9 is an example.

FACIAL PAIN OF UNCERTAIN ETIOLOGY

Case 9 (A250831). Mrs. W. T., aged thirty-eight years, had an exploratory laparotomy May 14, 1921, and a diagnosis of linitis plastica was made. Immediately after the operation she had constant slight burning pain over the second and third divisions of the left fifth nerve, as if burned by the ether. This continued unchanged until August 9, 1923, in the meanwhile extending to include the first division area, the left side of the tongue and the inside of the mouth. The condition was not influenced, except that it was worse with fatigue, and after exposure to cold wind. There was also dull aching pain around the left orbit, especially at the outer margin. This was not constant, occurring about every three weeks.

Examinations of teeth, sinuses and local structures were negative, as was the neurologic examination. Cocainization of the right sphenopalatine ganglion made the pain worse. No definite diagnosis was made.

This case represents a vague, intangible group of symptoms and, although simply detected, extraordinarily difficult to interpret. The patient has pain that seems to fit into no known category, and corresponds to no known classification. There are many such patients seeking relief, and often failing to get it. Their disease is often disguised by terms, such as facial neuralgia, which mean nothing to the physician, but usually satisfy the patient. Until the cause is known, treatment, obviously, is inefficient, and too often consists of analgesic remedies

that give only temporary relief. Surgery makes the pain worse, and until there is a more complete understanding of what these symptoms signify, there can be no progress toward cure. As a symptom, pain in the area supplied by the fifth cranial nerve requires the utmost skill and patience of the diagnostician to interpret, and only too often a reasonable conclusion as to its significance cannot be reached. Further study, observation and research may in the future clear up these problems as well as correct many of the mistaken ideas at the present time.

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DISCUSSION

DR. ANGUS MORRISON, Minneapolis: Dr. Parker has very ably presented the different clinical conditions which may be responsible for pain in the area of distribution of the fifth nerve. The matter of determining the cause of such pain in certain cases is not always easy. When we have determined the cause, we are often able to alleviate the pain by alcoholic injections or by a more radical surgical procedure; in other cases, those which are due to a psychoneurotic cause, by helping the patients to adjust themselves in facing their situations.

However, as Dr. Parker has mentioned, there is a group of cases having pain in the area of the fifth nerve for which no etiological factor can be found. Dr. MacGibbon, who will follow me in the discussion, has some very interesting

facts, not only as to the possible cause of at least some of those cases falling into the group of unknown etiology, but also a method of relieving the pain in this particular group.

Before discussing this further, I would like to hear what Dr. MacGibbon has to say.

DR. E. E. MACGIBBON, Minneapolis: Although I am supposed to discuss Dr. Parker's paper, I am not qualified to talk on the subject of tumors, migraine, etc. I can only speak of pain in the area supplied by the fifth cranial nerve from the dental viewpoint.

Dr. Parker states that there are a number of cases, the etiology of which is not known. We hope to explain the etiology of a percentage of this group of cases by a theory of ganglionic trauma resultant from abnormal mandibular movement.

Let me explain our point with this chart of the lingual aspect of the right mandible, ascending ramus, Gasserian ganglion and the numerous nerve trunks and foramen in this locality. You will notice that the mandibular nerve leaves the Gasserian ganglion through the foramen ovale and passes through soft tissue to the mandibular foramen, where it again enters bony structure. Cunningham's Anatomy and other anatomists tell us that in the normal mandibular movements this nerve trunk is subject to a slight strain.

In patients who have suffered the loss of teeth, abrasions or malocclusion, we have abnormal mandibular movements which put an additional strain on the mandibular nerve trunk and also the Gasserian ganglion and its branches.

Working on this theory we have restored facial dimensions and stabilized the mandible by the means of artificial dentures and brought about relief of the neuralgia symptoms over a period of one to four months; the pain returning when the patients became accustomed to their plates and returned to excessive mandibular movements again. These plates were taken from the patients for a few days and the neuralgia returned and was relieved shortly after the plates were inserted again.

One patient I remember very distinctly. We took his lower plate from him, unbeknown to him, because we wanted to see if the pain would return. Two days later he was at the entrance to the Clinic in the early morning waiting for it to open so he could get his plate back. He was biting on a piece of wood to hold his mandible quiet to try to prevent the neuralgia.

You will notice these people talk with their mouths closed, they do not enjoy eating, and they are always trying to keep the mouth quiet for fear that the pain will return. That is why I think when patients say they have had a tooth extracted and feel better for a few days, it was due to a sore mouth which the patient was favoring. Working for three years on this theory of ganglionic trauma due to abnormal mandibular movements our results have been so gratifying we cannot help but feel that herein lies the cause of a percentage of these cases of paroxysmal trigeminal neuralgia.

I say "we" all through this discussion, because my associate, Dr. W. K. Haven, deserves every bit as much credit as I do for this work.

In closing I would like to give a technique that is painless for the relief of paroxysmal trigeminal neuralgia. A

number of authors speak of a trigger or one nerve trunk that seems to set off the tic. With this thought in mind I have found this nerve trunk in a large number of cases by a process of elimination with a series of novocaine injections. After finding this trigger, it was injected with two per cent novocaine, followed ten minutes later by the alcohol. I have been able to relieve the tic neuralgia in each case for a period of several months.

This has an advantage over the other alcoholization by injecting one trunk only instead of several, as has to be done in severe cases if several nerve trunks are involved in the neuralgia.

DR. THOS. B. HARTZELL, Minneapolis: I would like to add a word to this discussion. About five years ago, Dr. Silverman, of Atlanta, Georgia, gave his experiences with some 20 or 25 cases; and he pointed out the fact that that branch of the fifth nerve that passes around the coronoid process is frequently the one at fault. It was through him that I described the method of singling out the offending nerve by anesthetic injection into the several trunks, thus finding the offending trunk which when injected gave relief from pain. Since reading his article I have seen quite a considerable number of cases of so-called trifacial neuralgia, and I have had three in which that branch which is illustrated in the picture as passing around the coronoid process has happened to be the one. Whether or not that is due to the fact that that branch is bent and flexed a good deal in the act of mastication, I do not know; but I do know that when that one does happen to be the branch, if you will load it with alcohol, usually the neuralgia is relieved. It was, in these three cases, at any rate.

DR. ARNOLD SCHWYZER, Saint Paul: I want to emphasize the one point that if you have a neuralgia in the face you should examine minutely all of that side. Two cases made that very clear to me. One case was brought in, an Italian with a tremendous tic douloureux apparently in the orbit and in the supra-maxillary area. We found a bad tooth in the lower jaw, an infected tooth. He didn't think that that could be the cause, but he had it pulled, and he has remained well since. That is not so very recently; it is at least over a year.

The other one was a case of a nurse who had a number of things done to her tic. She had very severe attacks, and she was dozey from morphine. Again we found a tooth that brought on these tics—this time in the upper jaw. The tooth was removed and that relieved the condition. She was apparently not entirely free from pain during my summer vacation; she had some pain, and she went back to the dentist. There were three or four teeth behind the bad one, which were perfect, and this dentist drilled every one of these teeth and took the roots out so as to relieve the pain (!). Now those were good teeth, and they were criminally damaged that way.

In 1903 I went to Munich to see the man who first brought out these alcohol injections in trifacial neuralgia. Professor Schloesser was doing that work. He complained bitterly that some other people had stolen his idea and had published things. One thing that I saw and which seemed to me particularly good and valuable was this: He has an entirely different method from the usual one to inject the

third branch, and his is so simple that a man with a reasonable amount of dexterity can do it out in the country, if he just tries first on an ordinary skull. You take the lower jaw; you outline the ascending branch with your fingers; then go directly in the axis of this ascending branch in with a long needle, which is not too pointed, but rather cut off less obliquely than the usual hollow needles, and you just advance that needle upward on the inside of the jaw, always exactly in the line of the ramus ascendens. When you are halfway up you find you hit a little bit of a prominence. There is a little prominence just over the entrance of the dental nerve, the lingula, and that as a rule you can make out very easily. Then if you push the least little bit ahead, the patient will tell you he has pain in his teeth; and if you should inject a little bit of alcohol, he will tell it to you in a vivid way. Then you can go up further and you strike the part where the third branch gives off the lingual nerve; and if you strike that he will tell you he has pain now also in his tongue. Then you go straight up to the base of the skull; you cannot hit anything dangerous there; and all you have to do is to feel with the point of your needle along the skull, moving the point of the needle gradually inward until you come to a depression. This depression is the foramen ovale.

I have demonstrated this to many doctors and had them try it, and they usually hit it the very first time. The fact is that if you don't always hit it, you can inject a little and feel your way through until the patient is very emphatic, and then you are sure you have hit the nerve.

Twenty years ago (I had just come home from Europe) I had an extreme case of tic douloureux, a most pitiful

picture. I injected alcohol there several times; and I just saw that woman's granddaughter last week, and she told me that the patient has remained absolutely well. So even in fierce cases of tic douloureux, which are known as a rule not to yield to alcoholic injections, you are liable now and then to get a good result, a permanent result.

DR. H. L. PARKER, Rochester (closing): I am very grateful for the liberal discussion that my paper was accorded, and I regret that my time was not long enough to permit me to bring up the question of therapy. Therapy in these cases is, of course, a very difficult matter and the cases that I had selected for discussion were in the majority very severe ones wherein almost every form of therapy had been attempted in vain. In most of them there had been too much therapy.

I hardly like to enter into the discussion as to the etiology of trigeminal neuralgia since, of course, that has been more or less carefully gone into in the last decade. The assumption as to the cause of the disease from the success of a given treatment is a very risky one unless the patient has been followed over a long period of time, since such cases tend to go into spontaneous remissions whereby it may be erroneously inferred that they have been cured.

I was particularly interested in Dr. MacGibbon's discussion as to the cause of a particular type of pain in the face and I assume that he was particularly referring to the type designated paroxysmal trigeminal neuralgia. He has offered a very definite and common sense therapy and I feel that in the future when this has been thoroughly tried out new interest and new light will be cast on the whole subject.

PAYMENT OF ANNUAL DUES

The fiscal year of most of the state medical associations has been made to correspond with the calendar year. It would undoubtedly simplify matters considerably, so far as records of county, state and national societies are concerned, if the calendar year coincided with the fiscal year in all states, but some of the oldest associations prefer to adhere to long established precedent and their wishes in the matter are supreme and are accorded the fullest respect.

In all state associations which begin their fiscal year on January 1, state dues are payable on that date and, of course, dues to county societies are payable at the same time. There are very few members, if indeed there be any at all, who are not fully aware of that fact, but there are a great many who, through sheer carelessness or otherwise, neglect to send their dues to county secretaries for weeks or even months after they have become payable. Some societies are very lenient in the matter; some, indeed, are entirely too lenient. Others are very strict and drop from their membership rolls all who have not paid annual dues by January 1. In most instances, state associations whose fiscal year begins with the calendar year allow the names of delinquent members to remain on the roster until April 1, at which time they are dropped if dues are still unpaid.

The membership roster of the state association is made up of the names of members reported by the county secretary to the state secretary; the membership roster of the American Medical Association is made up of the names of members reported by the state secretary to the secretary

of the American Medical Association. Obviously, a man who does not pay his dues to his county secretary at the right time need not expect his name to appear on the list of members of the state association or on that of the American Medical Association. The county secretary who does his full duty has enough to do without having to be everlasting after members to pay dues when due. Incidentally, the state secretaries and even the office of the Secretary of the American Medical Association are reasonably busy. It costs medical societies money when the secretaries have to enter, drop and re-enter names, over and over, year after year. But aside from all that, membership dues should be paid and paid promptly when due just because it is right that they should be so paid.

As is pointed out in another column in this issue of the *Bulletin*, the reapportionment of delegates from the state associations to the American Medical Association will be made at the next annual meeting in Chicago. This will be effective on the basis of the membership of state associations as they have been reported to the American Medical Association, April 1, 1924.

While reminding members of their duty to pay annual dues at the right time, it may not be amiss to remind those county secretaries who are negligent about reporting to state secretaries—and there are such—that such negligence works hardships and injustice on members who have paid their dues and who are entitled to have their names properly recorded on the membership rolls of state associations and the American Medical Association.—*A. M. A. Bulletin*.

TUMORS OF THE SPINAL CORD: SURGICAL TREATMENT AND RESULTS*

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Inasmuch as surgical treatment of tumors of the spinal cord offers the only possible relief for patients so affected, and since 50 per cent of such tumors exposed at the time of operation are removable, it is imperative that careful examination be made of patients complaining of root pains or atypical abdominal pains, and also of anesthetics and paralyzes of the extremities, in order to rule out the possibility of tumors of the spinal cord. It is also very important to make a diagnosis early, before paralysis becomes too marked, since the recovery following surgical treatment of patients whose complaints are of short duration is more complete and rapid.

PATHOLOGY

The type of tumors of the spinal cord depends on the origin of the neoplasm; those arising from the vertebrae and from the tissues of the spinal canal are bony, cartilaginous or fascial; those arising from the meninges are endotheliomas, fibromas, psammomas, and so forth. Such tumors, as a rule, are not very large, are slow growing, and rarely malignant; their early removal favors ultimate cure. Tumors of the cord itself are usually gliomatous, and arise around the central canal; some degenerate and become cystic, others remain firm and solid. Ependymal gliomas arise from the conus and extend downward through the canal of the lumbar region, and occasionally to the sacral region. Most ependymal gliomas in the lumbosacral region are encapsulated and not adherent to the lumbosacral roots, but may be situated between them and fill the spinal canal. Besides the ependymal cell gliomas in the area of the cauda equina, large cystic, degenerating neurofibromas sometimes occur, which develop slowly and erode the laminae; they also produce blocking of the spinal canal and there is likely to be yellow spinal fluid below the tumor.

SYMPTOMS

A thorough history is invaluable in making a differential diagnosis in these cases, since the complaint at the onset may be only a slight sensory or

motor loss followed by an increase in the severity of the initial complaint, with a greater sensory loss or paralysis until there is complete loss of all sensation and motor power, besides increased reflexes below the level of the segment involved. Bladder, sphincter, and sexual control disappear last in cases of extramedullary tumors, but disappear early in cases of intramedullary tumors. The combination of symptoms depends on the relation of the tumor to the spinal cord: those arising dorsally will first produce sensory changes; those arising anteriorly, motor disturbances, and those arising laterally, the Brown-Séquard's syndrome. Tumors arising from or attached to spinal nerves will produce pain, while those originating in the meninges or cord without coming in contact with a nerve root may develop without pain. In many instances the initial symptom is pain, but as anesthesia progresses the pain frequently diminishes, and may be absent at the time of examination.

It has been customary to defer laminectomies until the patient presents a definite sensory and motor level, and it is not uncommon to examine patients who have undergone various laparotomies for pain, without relief, when in reality they were suffering from root pain. A number of patients have been explored recently in the Mayo Clinic who complained of excruciating root pain without impairment of motor function, and with or without slight sensory disturbances. The pain of which such patients complain is very similar; it usually radiates along the distribution of one or both sciatic nerves, and is associated with or without tenderness over the upper lumbar spine. The pain is exaggerated by coughing, sneezing or bending forward, and also when the patient lies down, becoming so severe that he is compelled to leave his bed and walk around; it is unlike the pain of true sciatica, which is relieved when the patient reclines and flexes back and extremities. Tumors of the cauda equina are likely to produce pain for months before sensory or motor disturbances appear. A good rule to follow is thorough examination of the patient who complains of sciatic pain, but is not relieved by the usual treatments for sciatic neuritis and sacro-iliac disease. Besides the neurologic examination, differential pressure determinations of the spinal fluid of the cisterna magna, and of the spinal fluid at the fourth lumbar interspace, may be of some diagnostic value. If there is a block in the spinal canal, the pressure of the fluid in the cisterna magna is

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greater than in the fluid at the fourth lumbar interspace when the jugular pulse is compressed. This blocking can be produced by inflammatory lesions of the meninges, but it is more likely to be caused by a tumor of the spinal cord. Pneumography of the spinal canal may prove of some assistance in determining the character of the lesion, but usually, if careful neurologic examinations are made, the levels of anesthesia and paresis can be elicited early in the course of the disease. Spinal punctures also are of diagnostic value. When yellow spinal fluid is obtained by puncture, it too suggests blocking of the spinal canal. The Nonne test is often positive in cases of tumors of the spinal cord, but the average cell count is normal and the Wassermann test of the spinal fluid is not made positive by the presence of the tumor.

SURGICAL PROCEDURES

No special technic is required in laminectomies for the removal of tumors of the spinal cord, except the precaution against traumatizing the cord, or permitting hemorrhage within the dura. The spines and laminae are removed; the muscles are closed in two planes with interrupted and continuous sutures of catgut, and the skin is closed by a subcuticular stitch of catgut, and a dermal suture. If the tumor is in the cervical region, unilateral laminectomy is performed, with removal of the lamina opposite and the spine over the tumor. This precaution is taken because one patient had a recurrence of symptoms owing to slipping of the bodies of the cervical vertebrae, which caused traction and pressure on the cervical cord, and resulted in paralysis. I prefer the one-stage laminectomy, but have found it necessary to perform the two-stage in seven cases, and a three-stage in one, because the lesions were so extensive. As a rule, three spines and laminae are removed before the dura is opened; five or six can be removed with little difficulty. Ependymal cell gliomas of the cauda equina usually extend from the eleventh dorsal to the first or second sacral vertebra, and in such cases there will be complications if too much is attempted at one operation. Otherwise, the one-stage operation is very satisfactory, especially to the patient.

THE ANESTHETICS

Ether has been employed as the anesthetic in most cases; however, obese patients and patients who are poor surgical risks have been operated on very satisfactorily under paravertebral anesthesia. It is necessary to apply a one per cent solution of

novocain to the dura, which is exposed during laminectomy, and is not desensitized under paravertebral anesthesia. A few drops of the solution can be injected into the dural canal above the tumor without danger. Novocain can also be used to produce intraspinal anesthesia in low laminectomies of the lumbar and sacral regions, but should be used cautiously, if at all, in middle dorsal or upper dorsal lesions.

POSTOPERATIVE CARE

The care of patients after laminectomy differs little from their care after other operations. Preferably for three or four days, the patient is kept on his abdomen on three or four soft pillows, his head slightly lower than the operative field, always avoiding undue pressure on the bony prominences. He is then permitted to turn on his side, and after ten or twelve days to lie on his back. About the fourteenth day he may sit up in a chair. He is more comfortable in the prone position, the wound heals more rapidly, and there is less danger of drainage of cerebrospinal fluid, especially in cases of intramedullary tumors in which the dura is left open. Provided the patient has not previously been catheterized, the bladder is allowed to overflow. If there is cystitis and the patient has been catheterized, a retention catheter is inserted before operation, and changed about once a week. The bladder is lavaged daily with a two per cent solution of boric acid, and about 15 c.c. of a 10 per cent solution of argyrol is introduced and allowed to remain in the bladder for one-half hour. If there is any evidence of pyelitis, acid sodium phosphate and hexamethylenamin, seven grains of each, three times a day, are administered. This is followed by a week of rest, then a second course of medication.

SURGICAL TREATMENT AND CONVALESCENCE

Extradural and intradural but extramedullary tumors can usually be removed completely with very little difficulty, but intramedullary tumors are difficult to remove. In my experience one endothelioma only could be removed completely; this tumor arose apparently from the pia mater and extended into the cord. In several instances I have attempted partially to remove intramedullary tumors, and sometimes have split the cord dorsally and permitted the tumor to extrude. The results have been twofold: certain patients have been made worse, others have improved for a time and then symptoms have recurred. As a whole, the results of removal of intramedullary tumors are unsatis-

factory, and I believe that, unless the tumor is very close to the dorsal surface of the cord, less damage will be done and more temporary relief afforded the patient by laminectomy and dorsal incision of the cord. The administration of radium may prove of some value; one patient apparently improved; another improved for one month following partial removal of an intramedullary tumor and then failed until he was paralyzed completely. If radium is used, it should be screened very carefully, and not placed directly on the cord.

Recovery depends on the duration of symptoms. If the tumor has been removed without trauma, a patient who has had symptoms for one year or less may be expected to recover completely, and if he has had symptoms for not more than three years, to improve markedly. Recovery is more complete following the removal of soft tumors than hard, nodular ones; and, if the same degree of paralysis exists, recovery is more complete if the tumors are in the caudal or lumbar region, than if in the dorsal or cervical region.

MAYO CLINIC CASES

The records of the Mayo Clinic from January, 1910, to October 1, 1923, show that 151 patients with a diagnosis of possible tumor of the spinal cord have been explored. Eighty-eight of these patients were males, and sixty-three, females. The oldest patient operated on was sixty-five years, and the youngest, twelve years; the average age was forty-one years. For purposes of study the patients were divided into nine groups:

Group 1.—Twenty-one patients with extradural tumors.

Group 2.—Forty-six patients with intradural but extramedullary tumors.

Group 3.—Forty-one patients with intramedullary tumors.

Group 4.—Thirty-two patients in whom no tumor was found. Some of these patients had chronic meningomyelitis, and in four, tumors were found later.

Group 5.—Four patients with angioma (varicose veins) of the spinal cord. One patient gave a positive history of syphilis.

Group 6.—Only one patient in whom an echinococcus cyst of the cord was found; she had been operated on for echinococcus cysts of the lung and liver.

Group 7.—Two patients with tuberculoma of the cord, one of whom had an extensive tuberculoma on the anterior and lateral surfaces of the cervicodorsal cord, associated with miliary tuberculosis; these findings were verified at necropsy. The other patient had unilateral inflammatory lesions of the cauda equina, resembling tuberculoma without neoplastic cells; the condition had not progressed since 1917.

Group 8.—Two patients with gumma of the cord; both gave histories positive for syphilis, and presenting definite levels of paralysis. In one the meninges were thickened and adherent to the cord in a large mass for 4 cm. The other patient gave a history of symptoms for about six months, and presented much the same findings except that the dura could be separated from the soft inflammatory mass. Part of the mass was removed at operation, the wound was closed, and the dura left open. The patient recovered his motor power and sensation, and was apparently free from symptoms for four years following operation, after which there was no further record.

Group 9.—Two patients with cerebellospinal tumors; the age of one patient was forty-eight years, and of the other, two and one-half years. Both had tumors of the vermis, extending through the foramen magnum into the spinal canal. Partial removal only was possible, and both patients died soon afterward.

Duration of symptoms.—The average duration of symptoms was twenty-nine months in Group 1, fifty-two months in Group 2, forty-one months in Group 3, and forty-five months in Group 4. The number of patients in the other groups is too small to permit of a fair estimate.

Root pain.—Fourteen patients, two-thirds of the number, in Group 1, had root pain, it was present in thirty-six patients (78 per cent) in Group 2, in thirty patients (73 per cent) in Group 3, and sixteen (50 per cent) in Group 4. Two of the four patients in Group 5 had root pain, and four of the seven patients comprising Groups 6, 7, 8 and 9 (57 per cent) had the pain.

Paralysis, and motor and sensory disturbances.—While sensory paralysis and motor disturbances are the predominating symptoms, it is not uncommon to see patients with only one or the other. Nine of the 151 patients had no motor disturbance, ninety-eight had partial motor disturbance, and

forty-four had complete paralysis below the level of the lesion. Ten patients had no sensory disturbance, eighty-six had partial loss of pain, tactile and temperature sensibilities; fifty-five had complete loss of sensation below the level of the lesion, thirty-four had no bladder disturbance, seventy-six had partial loss of bladder control, forty-one had complete loss of bladder control, twenty-nine had no loss of rectal sphincter control, seventy-three had partial loss, and forty-nine total loss.

SPINAL FLUID FINDINGS

These findings reveal the frequency of xanthochromia, high cell count, globulin and positive Wassermann reaction. One hundred seventeen spinal punctures were made on the 151 patients operated on. Xanthochromia was found in the spinal fluid in fifteen; there was a positive Nonne test for globulin in fifty-six, and the average cell count was three in those in whom the count was taken, the highest count being 29. In all the Wassermann reaction on the spinal fluid was negative, although three patients gave histories positive for syphilis.

LOCATION OF TUMOR

In seventy-eight patients, the tumor was in the dorsal region; occasionally it extended into the cervical and lumbar areas, but the principal portion was in the dorsal region. In twenty-six patients, the tumor was in the cervical region, in fifteen in the lumbar, and in four in the sacral. In twenty-eight no tumor was found, or the symptoms were caused by an inflammatory process.

Sixty-one tumors were completely removed (50 per cent of the 119 tumors found), and thirty were partially removed (25 per cent). In thirty-two patients, no tumor was found at the time of operation, the lesion being a meningomyelitis, or a tumor which was missed. Four patients of the series proved later to have had tumors, two endotheliomas of the cord, and two, Middeldorpf tumors of the sacrum. In twenty-eight instances it was impossible to remove the tumor.

END-RESULTS AND SUMMARY

The records of patients operated on from 1910 to the present time are reviewed; patients operated on during the last year or two have not, of course, had sufficient time to experience the maximal amount of improvement, and therefore the end-results should be better than they now seem. One hundred eight of the series of 151 patients are living; thirty-three are perfectly well and working;

six are improved and doing some work; thirty-five patients are improved, but not working, and six improved for a time, but their symptoms returned due to progression of the lesion. Fifteen of the patients are helpless, and thirteen were not traced. One hundred sixty laminectomies were performed on the 151 patients, seven patients having had two laminectomies and one a triple laminectomy for extensive lesions.

One hundred nineteen neoplasms were found at the operating table, 80 per cent of which had been correctly diagnosed. Sixty-one tumors were removed completely, 50 per cent of the total number found, and thirty tumors were removed partially, 25 per cent of the tumors found. Thirty-three of the patients were cured and working, 36 + per cent of the number in whom tumors were removed or partially removed, six patients were improved and doing some work (6.5 + per cent), and thirty-five were improved but not working (38 + per cent). Seventy-four patients improved following operation, which was equivalent to 48 per cent of the 151 in whom laminectomy was performed, or to 62 per cent of the 119 patients in whom tumors were found.

DISCUSSION

DR. J. FRANK CORBETT, Minneapolis: Dr. Adson's descriptions were so graphic and the whole paper so pregnant with suggestion that I hesitate somewhat in trying to add anything to that paper. However, in a very homely way I shall try to bring before you the picture that we so often see: An individual with complete motor paralysis, complete sensory paralysis, paralysis of the bladder and rectum, covered with bed sores, tortured with pyelitis, awaiting death. That is the picture of spinal tumor that we sometimes see; and it for the reason that we do see these advanced cases that the results of spinal surgery are not better than they seem to be. All of these cases—or the great majority—at some time were operatable; but the diagnosis of spinal tumor is difficult. So many times the picture is so indefinite that these cases have been treated for pleurisy, have been treated for gall-bladder disease, have perhaps had every conceivable operation done upon them except the one they needed. Then finally after a long series they come to the neurologist and to the surgeon for operation. Dr. Adson's talk has done much to clarify the diagnosis. He could not by any means go into all of the details; but he has hinted at many things that I think will be of value to all of us.

In regard to the treatment I am thoroughly in accord with what Dr. Adson has said in regard to the two stage operation. It frequently is necessary to remove a large number of laminae. There is bound to be some hemorrhage with this and some shock. The local anesthesia lessens the hemorrhage, lessens the shock, lessens the danger that

comes from the recovery from the anesthetic. That is material. It is efficient and easily done. There are one or two places in the past where I have failed, and usually it has been on account of the one stage operation. I have tried to do too much. Particularly where you have an extradural tumor or any type of tumor that extensively involves the roots, be careful with your dissection. Always in that kind of case I should say do a two stage operation. Blocking the roots if feasible with novocaine may in some measure prevent the shock; but the most severe shock and the things that I have regretted most in my life have been too much interference with the roots. You can do a lot of surgery in other places, but you cannot do it there.

I think this is a wonderful series. I had one case, a varicosity of the spinal cord; and I thought it was so rare a case that I would dilate upon it. But much to my chagrin here Dr. Adson presents four of these cases. A simple decompression will accomplish improvement, but it is short lived, or apt to be. On the other hand, radical removal is apt to do a great deal of damage; and if attempted at all they must be removed radically.

DR. R. E. FARR, Minneapolis: In discussing this paper I feel something like a greyhound barking at an express train going by. My experience in this class of work has been very small; and still there are one or two points that I might dilate upon. Dr. Adson mentioned that there were three methods aside from those that he had given us for locating and diagnosing these tumors. He spent very little time on diagnosis, and he only mentioned one of these—perhaps forgot the other two. There is one thing that I believe it is well to call attention to at least, and that is the method of Ayer. Dr. Adson referred to this in a way when he called attention to the difference in the color of the fluid above and below the tumor. This method is, as you all know, the putting in of two needles, one above the supposed seat of the tumor and the other below, giving a difference in manometer reading, giving a difference in pulsation, from the blood pressure and from cough straining and sneezing and so on, and giving a different type of fluid from above the tumor and below. It seems to me that that is one of the best methods of diagnosis that has been brought out in recent years.

The difficulty of local anesthesia is not manifest until the cord and membrane are exposed. In the few cases that we have operated upon we found not the slightest difficulty in exposing the cord under straight infiltration anesthesia. We find it lessens hemorrhage, lessens shock. We have the co-operation of our patient and the patient can be made quite comfortable on the table. I believe the operation can be done fully as rapidly or more rapidly than if general

anesthesia is used. When the membranes are exposed, we find them exceedingly sensitive. The first one I did was especially sensitive. The use of local anesthesia may bring out what Dr. Corbett has called attention to, that is, the opportunity to avoid doing too much.

We tried two methods in an effort to produce anesthesia in spinal nerves. We tried bathing the nerve filaments in strong cocaine and injecting them with a very fine needle with novocaine. Now butin has been developed. It is almost as efficient a drug locally as cocaine, and much less toxic. I have not yet had a chance to use it, but I would suggest bathing the tissues with it in such a manner as not to allow it to get into the spinal fluid circulation in these cases. If we can get anesthesia of the local tissues after we have uncovered the cord and membranes, then local anesthesia in this work is going to mark an even greater advance.

DR. A. W. ADSON, Rochester (closing): I am very grateful to Doctors Farr and Corbett for their discussion and appreciate Doctor Farr calling attention to the differentiation pressure method of Ayers. In my discussion I intended to present Doctor Ayers' technique and Doctor Dandy's pneumography method for determining spinal block. The differentiation pressure method is very valuable in determining spinal block. Two spinal puncture needles are used; one is placed in the cisterna magna and the other into the fourth lumbar space. In the absence of spinal block the pressures are equal, but in the presence of spinal block, due to a tumor or inflammation, the pressure indicated by the manometer is greater in the cisterna magna than in the fourth lumbar interspace when the jugular pulse is compressed. This method does indicate block, but occasionally small tumors exist which do not produce block and inflammatory lesions will produce block similar to tumors; though spinal block has been determined, it is not definitely localized and needs careful neurologic examination to determine the level. Pneumography of the spinal canal has also proven of value; this procedure consists of withdrawal of spinal fluid from the fourth lumbar interspace and the injection of an equal quantity of air which seeks the upper level and indicates the block in the spinal canal which is manifested by a darker shadow on the roentgenogram.

While I have laid great emphasis upon the importance of early diagnosis and surgery in spinal cord tumors, I do not want to give the impression that every paraplegic patient has a cord tumor, but urge that the paraplegic should be given a thorough neurologic examination, and when a patient comes with atypical pains, one should not forget the possibility of existing root pains caused by spinal cord tumors.

FACTORS IN HEALTH AND DISEASE THAT AFFECT THE METABOLIC RATE*

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The general term metabolism includes anabolism or the taking in of food, with its conversion into tissue and storage in the body, and catabolism or the breaking down of material in the body with the liberation of energy.

This process is an oxidative one involving the utilization of oxygen and the production of carbon dioxide. By the term metabolic rate we mean the speed at which this transformation of energy is taking place.

The determination of the metabolic rate is not an exceedingly difficult procedure, but consists in having the patient breathe indoor air and exhale into a tank. This is done for a definite length of time. The exhaled air is then analyzed for oxygen and carbon dioxide. This analysis tells us what kind of substances have been burned during the test. Knowing this and knowing how much oxygen has been used, we can calculate the number of calories that have been burned.

The difference between the metabolic rate and the basal metabolic rate must be clearly understood. In the performance of the basal test the patient must be in the state of complete rest, and must have abstained from food for twelve to eighteen hours. The calories produced under these conditions are then compared with standards obtained from normal individuals under the same conditions, and the results expressed in percentages above or below normal.

The normal energy expenditure in an adult varies between 35 and 40 calories per square meter of body surface per hour. In the newborn the energy expenditure is low. This increases for three to six years, when it begins to decline rather rapidly. At about twenty years the decrease becomes much slower. In the female the energy expenditure is less than in the male.

In this paper we propose to discuss the various factors that will change the basal metabolic rate to a non-basal rate. These factors can be conveniently grouped under the headings of: (1)

muscular activity, (2) temperature changes, (3) specific dynamic of food, (4) medication, (5) starvation.

Muscular exertion increases the metabolic rate more than any other factor; and under this head should be considered the involuntary muscular movements such as shivering, dyspnea, and restlessness. Merely sitting up in bed can increase the metabolic rate 8 to 20 per cent; sedentary work 100 per cent; moderately hard work 200 per cent, and hard work almost 300 per cent. The muscular activity accompanying a chill may cause an increase of 75 to 200 per cent above the basal rate.

It is important to think of the effect of muscular activity on the metabolic rate when the treatment of overnutrition or undernutrition is being considered.

To demonstrate this effect let us select for example a type of individual frequently encountered in practice—a high strung female, 25 to 30 pounds underweight. She is constantly on the move, thereby keeping her metabolism rate up to a high level. Her predicted basal metabolism would be 65 calories per hour. Under conditions of activity such as sweeping the floor or washing dishes she would approximately burn up 150 calories per hour. A rest of one hour after each meal and two hours additional sleep at night would save for her almost 400 calories a day, or 4,000 calories in 10 days. This is equivalent to the calories produced by burning one pound of fat in the body.

In metabolic studies in active tuberculosis McCann found the metabolism to be between 20 and 40 per cent above normal. This he believed was not the basal rate, but that the increase was due to muscular exertion accompanying cough and restlessness.

The muscular activities must be considered in the ambulatory treatment of diabetes mellitus. Formerly we had to limit the individual's activities to the level of his metabolic disturbances. At present by means of Insulin we can increase his caloric intake to allow him sufficient energy to perform his daily duties. To secure the most economical use of Insulin and to get the best result from a diet, we must know approximately how many calories are being burned up in a day. With a knowledge of the character of work being done the caloric output can be calculated within 20 per cent.

Changes in body temperature alter the metabolic rate though not to such a great degree as does

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muscular activity. The metabolic processes are a series of chemical changes, and follow closely Van Hoff's law, which states that, "For each rise in temperature of 10 degrees C. the speed of a chemical reaction increases 2 to 3 times."

A temperature of 100 degrees F. may increase the metabolic rate 40 per cent. Although there is a definite relationship between changes in the metabolic rate and changes in body temperature, they do not always run parallel. The discrepancy when present is due to other factors than to temperature, such as toxic protein destruction and restlessness.

In some febrile diseases the metabolic rate is very high. In typhoid fever as many as 5,000 calories a day are produced. This shows how extremely fallacious was the old idea of starving a fever. The number of calories fed should be governed by the height of the temperature. At least 10 per cent of the basal expenditure should be added for each degree rise in temperature.

Changes in temperature in the medium surrounding the body also alters the metabolic rate. Cold stimulates heat productions in the body; a cold douche or shower bath at 60 degrees F. may increase the metabolic rate 200 per cent. This may last from one to one and a half hours. Temperatures higher than that of the body also accelerate the metabolic rate though not to as high a degree as does the lower temperatures.

A phenomenon little known to the practitioner is the specific dynamic action of food. This is a stimulation of the metabolic rate by the ingestion of food, resulting in a loss of energy to the body. This loss must be compensated for by an additional caloric intake. Protein possesses this property to the greatest degree, stimulating the metabolism 30 to 40 per cent above the basal rate. Fats cause increase of 12 per cent and carbohydrates 6 per cent.

In typhoid fever there is a marked increase in destruction of the body protein. This acts on metabolism in the same manner as does ingested pro-

tein. This is one of the reasons why the metabolic rate in typhoid fever is higher than in many other febrile diseases.

The stimulating effect of protein on the metabolic rate should be considered in those diseases where rest is essential. An increase in metabolism indicates that the body is doing more work. For that reason McCann advises against a high protein diet in active tuberculosis.

An example of the stimulating effect of protein was related to me recently. This patient, a decompensated cardiac case, noticed a marked improvement in his symptoms following a beefsteak meal.

Practically the only drugs that have an effect on the metabolism are thyroid extract preparations and adrenalin. Thyroid extract is extensively used in stimulating metabolism in hypothyroidism. Unless very carefully used it is not without danger. The symptoms of increased metabolism, such as tachycardia, nervousness and polyuria, indicate that a sufficient amount of the drug has been given.

The potencies of the various preparations on the market differ greatly as to their ability to stimulate metabolism. Thyroxin given intramuscularly increases it 2.8 per cent for each milligram injected. The effect reaches its height in about a week and lasts about ten days.

All of the factors hereto considered act to increase the metabolic rate; starvation, however, causes a decrease. In an experiment on a fasting man there was a drop of 29 per cent in the metabolism during the thirty days' fast. This apparently is nature's method of preventing the loss of body proteins.

This review has necessarily been very brief; the time allowing hardly more than an enumeration of the various factors that alter the metabolic rate.

It is important to remember that the basal metabolic rate is the lowest energy output consistent with life, and that this rate is readily changed by muscular activity, changes in temperature, food intake and thyroid preparations.

THE VALUE OF THE BASAL METABOLIC RATE IN GENERAL MEDICAL PRACTICE*

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In the consideration of this subject, I shall limit myself for the most part to that field wherein metabolic studies have been of most value; namely, thyroid disturbances, laying particular stress upon exophthalmic goiter, its symptomatology and differential diagnosis.

The metabolism test has emerged from the field of medical endeavor as one of the most valuable laboratory procedures. The past decade has been very fruitful in the development of laboratory tests which have made for medical progress as nothing else could have.

Their advent, however, has been attended on the one hand too often by skepticism, and on the other hand by a too ready acceptance of the finality of their results.

Much of this has been fostered by the tendency of rendering either a positive or a negative report without a closer investigation and discussion of the case. How often are patients branded as luetic on the exhibition of a false positive reaction? False positive Wassermanns are notoriously common, as well as the occurrence of positive Wassermanns in patients with other conditions than lues.

The presence of a negative Wassermann as excluding lues; the presence of a deformed duodenal cap as always indicating duodenal ulcer; the presence of a persistently increased blood sugar with a negative urine as always being of serious consequence, are only a few of the many false interpretations which might be, and often are, placed on laboratory methods.

The metabolism test, while being by far the most reliable and accurate of the many laboratory procedures, requires the observation of many important details which, if neglected, cause it to lose its deserved prominence in medicine.

Of prime importance is the efficiency of the technician,—the attainment of this efficiency being a matter of at least six months and preferably longer. The carrying out of the test under normal conditions, especially from the standpoint of the patient

as will be brought out by others in this symposium, is of the greatest importance. The repetition and even repeated repetition of the test in doubtful cases cannot be too strongly emphasized. This applies particularly to those patients whose first estimation is from plus 11 to plus 20 or 25. I have repeatedly seen patients who have previously been considered hyperthyroid on the basis of one reading, upon whom a subsequent reading would, I am sure, have been normal. As a matter of fact, a rate of plus 11 to plus 20 or 25, in my experience, on a re-checking proves in most cases to be within normal limit. There are isolated cases of hyperthyroidism presenting a low reading, but in these the symptomatology is in harmony with the rate and as a matter of fact they are quite often unrecognized clinically.

Plummer¹ states that the basal metabolism in a given case of exophthalmic goiter must be at least plus 15 before it can be recognized clinically.

According to Boothby² at least 95 per cent of all abnormally increased rates are due to hyperthyroidism (exophthalmic goiter and adenoma with hyperthyroidism) if there is no fever.

Increased rates are constantly present in exophthalmic goiter and hyperfunctioning adenomas, in the active stage of acromegaly and in fevers. They may occasionally be found in other diseases as essential hypertension, pernicious anemia, leukemia, diabetes, bronchial asthma, decompensated hearts, tuberculosis, carcinomas, etc.

Decreased rates are present in myxedema, hypopituitarism, in cases of inanition from prolonged fasting or from restricted food intake such as occurs in anorexia nervosa, in esophageal stricture or in cardiospasm.

In diabetes and pituitary tumors, basal metabolic readings are of definite value. The advantage of maintaining a diabetic on a diet somewhat below the basal metabolic requirement has been emphasized early by Allen and DuBois³ and more recently by Wilder, Boothby and Beeler.⁴ In pituitary tumors, metabolic estimations offer a valuable aid in diagnosis as well as prognosis. Patients with low readings are poor surgical risks.

The estimation of the basal metabolic rate has been of inestimable value in many fields of scientific investigation. With especial reference to the thyroid, one might mention the standardization of thyroxin, "the active principle of the thyroid gland" isolated by Kendall,⁵ the classification and pathol-

*Read in symposium at the annual meeting of the Minnesota State Medical Association, St. Paul, October, 1923.

ogy of goiter as brought out by Wilson,⁶ the total tissue content, as well as the daily exhaustion of thyroxin, etc., as noted by Plummer,⁷ the comparison of x-ray and surgical treatment as observed by Means and Aub⁸ and others; the aid it offers in choosing the proper course of treatment, etc. In fact, its uses have been so numerous that one can only begin to enumerate them.

It finds its greatest application, however, in the differential diagnosis of thyroid diseases, especially when associated with hyperthyroidism, from neurasthenia, hysteria, effort syndrome, etc. The epinephrin test has been found to be totally inadequate to differentiate between these conditions because of its frequent occurrence in normal individuals.

There is still a misconception amongst the medical profession as to where hyperthyroidism really begins. It is especially in the differentiation of the normal from the abnormal that the metabolism test finds its great value. Unless readings from 0 to minus 10 or plus 10 are interpreted as signifying an absence of hyperthyroidism, I see no reason for using the test at all. I have repeatedly observed a tendency on the part of many men to cling to the idea that a patient may still be suffering from hyperthyroidism, or at least partial thyroid intoxication, as they express it, in spite of normal metabolic readings. I feel that this conception is fostered by the idea of periodic thyroid intoxication measured in periods of a few hours or days instead of weeks or months as is the case in patients with true hyperthyroidism.

An increased amount of thyroxin in the body requires time for its exhaustion even though the stimulus giving rise to that increase be removed.

Following thyroidectomy for exophthalmic goiter, there is not an immediate return of the basal metabolism to normal, a state of hyperthyroidism still persisting over at least several weeks and often longer. In the case of thyrotoxic adenomata a normal level is reached in approximately seventeen days. In this connection, it might be interesting to note that according to H. S. Plummer,⁹ "after the administration of a single dose of thyroxin sufficient to bring the basal metabolism to normal, the physiologic status of a thyroidless patient becomes normal in from ten to twelve days, remains approximately normal for ten days, and returns to the pre-existing status in from five to seven weeks."

In a consideration of the symptoms of exophthalmic goiter, too much emphasis should not be placed

on the text-book cardinal symptoms; namely, tachycardia, exophthalmia, weight loss, nervousness and tremor. While having a definite significance and while being a usual accompaniment of this disease, they are by no means diagnostic.

DuBois, in his paper on exophthalmic goiter, says: "Exophthalmic goiter stands out as the disease of increased metabolism, and the increased metabolism stands out as the chief symptom of hyperthyroidism. The determination of heat production seems to afford the best index of the course and severity of the disease. There was great need for some purely objective test in hyperthyroidism to indicate the effect of treatment."

Exophthalmos is, to be sure, a very important finding and when present, especially with other symptoms, there is little room for doubt. However, many patients with exophthalmic goiter never develop exophthalmos, it being present in approximately only 60 per cent of cases. Tachycardia, nervousness and tremor are so commonly present in neurasthenia that they have little diagnostic importance, except as confirmatory evidence. There is a small percentage of cases in which an evident tachycardia is not present, at least in the sense that the pulse rate is above what we recognize as normal.

W. A. Plummer¹¹ has emphasized the importance of a feeling of sustained warmth as well as a history of ravenous appetite. I wish to re-emphasize these and other symptoms also brought out by W. A. and H. S. Plummer, which are almost diagnostic in themselves.

A feeling of sustained warmth is one of the most significant symptoms and is practically always present. When asked whether or not the patient feels abnormally warm in an average comfortable temperature, the answer is in the affirmative. Further questioning reveals the fact that this abnormal heat is not transient or as hot flashes, but permanent, measured not in terms of a few minutes or hours, but over a period of weeks or months. This feeling of abnormal heat is quite natural when one considers the increased metabolism together with the open periphery. The latter is evidenced by the low diastolic blood pressure and the resultant increased pulse pressure, another important finding in exophthalmic goiter.

A history of ravenous appetite is extremely suggestive. There are only two diseases, namely, exophthalmic goiter and diabetes mellitus, in which

weight loss occurs in spite of increased food intake. A ravenous appetite is present at some time during the course of the disease in practically all cases. It usually requires close and repeated questioning, not only of the patient, but also of his family, to elicit this symptom. This is, as is well known, a very uncommon finding in the neurasthenic, who quite the contrary complains of a poor appetite.

Weakness of the quadriceps groups again is also a very suggestive symptom. Although generalized weakness is practically always present the quadriceps muscles are affected all out of proportion to others. This manifests itself as an inability on the part of the patient to step up a high step without the use of the hands, or quite often even without assistance. The exophthalmic goiter patient, however, is not aware of this weakness until she actually makes the attempt, being imbibed with an unusual degree of confidence which persists in spite of repeated failures. The neurasthenic, on the other hand, attempts the same task with reluctance and a foreboding of failure, only to find that when finally attempted it is easily accomplished.

Other symptoms, such as palpitation; dyspnea, vomiting and diarrhea; generalized loss of strength; headache; abnormal sweating; pressure and fullness over the thyroid; choking spells, etc., are usually present but individually or even collectively are not diagnostic.

Symptoms which are present one day and absent the next are not those of exophthalmic goiter, the latter presenting symptoms which are constant and sustained over a period of weeks or months.

A persistent tachycardia with or without cardiac dilatation, the presence of a thyroid which has a granular feel, and especially the occurrence of thrills and bruits over the superior thyroid vessels are very common findings. Thrills and bruits occur in 60 to 80 per cent of cases.

Where the bruits are louder over the inferior thyroid vessels, they have no diagnostic significance, being quite commonly observed in neurasthenics in this location. Bruits, which have a variable intensity, becoming practically inaudible at times, point also to a functional basis.

Pulse rates of 120 or thereabouts, observed in patients in the office, are very common and when found together with an enlargement of the thyroid a diagnosis of hyperthyroidism is often made, only to be shattered the following day by the presence of a normal pulse rate and normal metabolic reading.

Neurotic individuals are especially prone to develop a rapid pulse which may be present repeatedly on examination, and its true rate in occasional cases being manifest only during sleep. A pulse rate of 80 to 90 is in certain individuals quite within normal limits.

The presence of an increased temperature in a patient with hyperthyroidism should be explained on the basis of an associated infection, most commonly a follicular tonsillitis, rather than on the basis of an accompaniment, of the disease, it being, in spite of the most marked metabolic increase, a condition free from fever.

Basal metabolic readings have an even greater field of usefulness in the determination of the presence or absence of hyperthyroidism in adenoma or nodular thyroids. Here one must rely mostly on subjective symptoms for the clinical differentiation, although cardiac involvement, with increased systolic and diastolic blood pressures, as well as a longer and more gradual course, is commonly present in the hyperfunctioning type. Exophthalmos, as well as thrills and bruits, is absent in these patients unless there is an associated pathological change in the thyroid as is found in exophthalmic goiter.

The average age at which these goiters develop is about twenty-two. An interval of approximately sixteen years occurs before toxic symptoms develop.

This type of goiter was first tentatively designated by Plummer as "toxic non-hyperplastic goiter," then "toxic adenoma," and now "hyperfunctioning adenoma."

The metabolism test affords great aid in the choice of treatment to be pursued. However, in this particular it should be utilized only in conjunction with daily observation of the patient with especial reference to pulse rate, tremor, nervousness, cardiac involvement, appetite and previous weight loss and in no case should it be used as an absolute guide as to the proper measures of treatment. By the latter, I refer especially to ligations and thyroidectomy, which will be discussed by another member of this symposium.

According to Crile¹² the metabolism test is of little value as an indicator of what to do. This I think should be modified and as before stated it should serve as one of the very valuable adjuncts in the preoperative regime.

In closing I wish to again emphasize the importance of the metabolism test, especially as it concerns thyroid work, but also as it applies to other fields of investigation. Its scope is broad, and under proper conditions it stands alone amongst laboratory procedures in the accuracy of its results and in the diagnostic information which it affords.

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ARGUMENT IN FAVOR OF THE REDUCTION OF TAX RATE ON EARNED INCOME

The provision of the proposed revenue law that makes the rate of taxation on earned income less than the rate on income from investments, speculation, etc., is new. The benefit thus conferred is to be extended to all taxpayers with earned incomes, and the physician is to be benefited merely as a member of the income-earning group. The concession in favor of earned incomes is based on the fact that taxation on an earned income is taxation on the productive activity of the taxpayer and tends to discourage such activity and that, since the productive activity of the taxpayer may be diminished or destroyed at any time by personal disability and is certainly destroyed by death, it is entitled to special consideration in the determination of the tax rate. The concession in favor of earned incomes has been recommended by the Secretary of the Treasury, but unless those who are to be benefited by it unite in an effort to make their position clear, the secretary's recommendation may not receive favorable action by Congress.

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THE VALUE OF BASAL METABOLISM IN A GENERAL SURGICAL PRACTICE*

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As a premise to any estimate of the value of taking a basal metabolic rate, the scope of its indications must be extremely well defined. The studies of Boothby and many other investigators have seemed to justify the conclusions that in actual practice about 95 per cent of all abnormally increased basal metabolic rates are due to hyperthyroidism, either of exophthalmic goiter or of hyperfunctioning adenoma of the thyroid, providing febrile states are eliminated, and proper conditions essential to physical and mental repose and the various necessary inactivities and inhibitions are complied with. This will leave, then, in this class of high rates, a very small percentage due to such diseases as acromegaly in its active stages (hyperpituitarism) and, at a lessened height of rate, essential hypertension, pernicious anemia, leukemia and diabetes, and possible some other diseases not yet investigated.

Lowered rates are found in the largest percentages in myxedema of varying grades of development or arrest, and also inanition from prolonged fasting or restricted food intake, such as in stricture of the esophagus or cardia-spasm. These bounds then, would seem to include particularly all the diseases in which extremes of basal rates occur, and the sincerity and thoroughness of the investigations have apparently established the tests as certainly valuable in their field.

Of first importance, then, in surgical practice, are basal metabolic rates in the diagnostic estimates of goiters. This general dictum will apply, at some points, to all forms of goiter, giving positive or negative information that may be of prime import. In exophthalmic goiter it is sometimes necessary that the final weight in diagnosis may be almost exclusively in the finding of an increased metabolic rate. The well known complex of symptoms may be so nearly absent, so rudimentary, undeveloped

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or masked that this laboratory evidence may be essential. In an instance in which exophthalmos is absent, the thyroid not palpably enlarged, the tremor slight, and the other subjective symptoms more or less minimized or concealed (and these conditions may obtain in an active state of the disease), a basal metabolic rate must form a most important part of the evidence in the diagnosis. The presence of fluctuations of malignity in this disease, the recrudescences and remissions, may all be traced accurately by basal metabolic estimate.

In hyperfunctioning adenoma also, the importance of a knowledge of the basal rate is paramount diagnostically. While in this disease the heights of increase are not so great as in active exophthalmic goiter, there is always an increase over a normal rate, and this is usually sustained and progressive and is not characterized by the remissions and gross range that are a part of the natural history of most cases of Basedow's disease. On the other hand many features in diagnosis of toxic adenoma are indefinite and difficult to attribute to their real origin in the goiter, and may be easily accredited to spontaneous myocardial incompetency or nutritional and occasionally senile changes, unless a basal rate is taken and its evidence properly evaluated. In fact by no other single method of examination can the diagnosis in this disease be so definitely determined, or its severity so certainly recognized.

A pre-eminent field for diagnostic differentiation by the basal metabolic rate, is the not unusual type of case in this part of the country, that presents a goiter and a host of more or less indefinite nervous and circulatory symptoms, but without typical or palpably significant changes in the thyroid, perhaps, besides, in an unusual decade of life for thyroid toxicity to occur. Much morbidity and unhappiness have resulted from ill advised surgery and foolish prohibitions of normal activities in this type, where absolute diagnosis has not been made by laboratory methods, and where an incorrect conclusion has led to the belief of severe thyroid disease and more or less vigorous treatment instituted upon this false basis. The large number of patients with colloid goiter and coincident nervous circulatory peculiarities can be catalogued on a more certain diagnostic basis than ever before by means of the basal rate readings.

In some of the hypofunctioning thyroids the

symptoms may be incomplete and inconclusive and ordinary clinical judgment fallacious. The extreme grades amounting to myxedema are sufficiently striking and pointed to make diagnosis certain, but between these very low grades and a normal function, are many stages of the disease that are made possible of effective identification and treatment, by a basal metabolic test only.

Next to differential diagnosis the most important service furnished the surgeons by the use of these estimates, is in the control of treatment of thyroid disease. A lowered rate after a severe and medically treated exacerbation in a patient with exophthalmic goiter, will indicate to the surgeon the favorable time for a partial operation that will permit an eventual later cure of the disease and security and farther decline of the basal rate, to the patient, in the meanwhile. Still again the rate will be informative as to whether sufficient of the gland has been removed so that cure will result, or whether still another partial removal will be necessary. Conversely, when by operative error or by incompetence of the part of the gland remaining to the patient, a degree of hypothyroidism ensues, its scope and limits may be accurately set, and treatment by the thyroid hormone gauged to the essential requirements.

The securing of a basal rate of any given height in a case of goiter does not in itself indicate operability or its reverse. It is impossible that any surgeon should determine that at a certain point, this or that operation is indicated, or is feasible or safe. As is well known, some types of individuals endure disease conditions much better than others. So, at the same known height of basic metabolic rate, one patient may have terrific tachycardia, gastro-intestinal disturbance and uncontrolled terror from extreme nervousness, where another patient with an equal metabolic rate may be taking his nutrition amply, have a reasonable pulse rate, and be of excellent morale, upon the whole, in spite of his disease. In the latter case certainly at least partial operation could be offered with confidence, whereas any operative procedure in the first instance would almost surely result in disaster. A high rate alone is not an index of the degree of disability, and operability must be indicated, or not, from the whole picture of morale and other clinical findings of probable strength and resistance.

THE TOTAL AND BASAL METABOLISM IN EXOPHTHALMIC GOITER*

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As emphasized by the preceding speakers in this symposium, the basal metabolic rate is exceedingly valuable in the differential diagnosis of diseases of the thyroid, and also in measuring the intensity of the hyperthyroidism. Unfortunately, all practitioners are not in a position to obtain accurate determinations of the basal metabolic rate. However, as the total metabolism in twenty-four hours is increased to an even greater extent than the basal metabolism, the former can be used as a diagnostic point, and the variation in weight as an index of the course of the disease and the patient's condition; a gain in weight indicates that the patient is doing well, while continued loss of weight suggests that the patient would not successfully withstand an operation.

In detailed studies we have found that persons with exophthalmic goiter or adenomatous goiter with hyperthyroidism, if left to their own inclination, eat from one and one-half to three times as much food as normal persons under the same conditions of rest or work. It is, of course, impossible in general practice to make an accurate study of the food intake. For diagnostic purposes, however, it is sufficient to learn, by direct questioning, whether the patient is eating more than usual, at the same time lying down a greater part of the day. Patients will say that there is nothing the matter with their appetite, and that they are eating more than normally. The significance of even an apparent slight increase in the amount of food taken is of particular importance if, at the same time, the patient is losing both weight and strength.

Often in cases of exophthalmic goiter, and but rarely in cases of adenomatous goiter with hyperthyroidism, an estimate of the total metabolism by the food intake is complicated by the occurrence of gastro-intestinal crises of nausea and vomiting. As the physician may be called now for the first

time, he should, on finding an increase in pulse rate with or without evidence of cardiac decompensation, inquire into the quantity of food taken in the few weeks preceding the onset of the crisis, which will reveal an increase in the consumption of food, accompanied by more or less loss in weight. If, however, the food intake has been restricted voluntarily by the patient, or on the orders of the physician, evidence of the increased metabolism is obtained solely from the rapid loss of weight. During a period of gastro-intestinal crisis with vomiting, or medical restriction of the food allowance, the patient may lose one pound a day. This is readily explained by the fact that these patients burn from 4,000 to 5,000 calories each day, and if no food is taken, they must burn their own fat at the rate of 400 to 500 gms., or approximately 1 pound of fat each day. Under these conditions, symptoms of acidosis, at least of mild acidosis, are superimposed on the true symptoms of the crisis. It is well known that with starvation, even in normal individuals, a mild condition of acidosis develops as soon as the carbohydrate reserves are exhausted; when the metabolism is increased, as in cases of exophthalmic goiter, a degree of acidosis equivalent to that of a normal person starved for three days may develop in twenty-four hours. In the crisis of ophthalmic goiter, a condition of low blood sugar may develop, accompanied by acidosis; although this is secondary, it forms a link in the vicious circle aggravating the symptoms, and should be avoided. Carbohydrates, therefore, are absolutely essential, and must be given by rectum if they cannot be retained by mouth. The widespread idea that restriction of food is beneficial, is erroneous. Several years ago a trial of a restricted diet was made at the Clinic. Patients on this diet failed to do as well as patients on a high caloric diet after this was adopted as a consistent line of treatment.

Until about two years ago, no specific treatment was known which would control the gastro-intestinal crises of exophthalmic goiter. During the last year and a half H. S. Plummer has demonstrated positively, that such crises can be stopped by the administration of Lugol's solution. The administration of from 30 to 60 drops of Lugol's solution for three or four days, then 10 drops daily, has invariably controlled all the cases of gastro-intestinal crises in exophthalmic goiter that have come under observation in the Mayo Clinic since the method of treatment was instituted. The effect of Lugol's so-

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lution in cases of exophthalmic goiter is quite as comparable as a life-saving measure and quite as striking and dramatic, as is the effect of Insulin in cases of diabetic coma. Besides controlling the gastro-intestinal crises Lugol's solution ameliorates the entire clinical picture of the exophthalmic goiter syndrome in a very large proportion of patients. Direct evidence of this is the regained appetite, and the coincident reversal of the weight curve from rapid loss to a slow but steady gain. This improvement is accompanied by a reduction in the basal metabolic rate. For from three to six days after giving Lugol's solution for the first time, there is no change in the basal metabolic rate; on about the eighth day there is a sharp drop in the basal metabolic rate, averaging from 20 to 30 points, sometimes exceeding this amount. The drop is most marked in the acute severe cases, less marked in cases of several years' duration, especially if the thyroid gland is rather large, and firm in consistency.

Kocher has repeatedly warned against the indiscriminate use of iodine in the treatment of goiter. This warning should be heeded because iodine in any form is very likely to change adenomatous goiter without hyperthyroidism to adenomatous goiter with hyperthyroidism; likewise it may increase the intensity of a mildly hyperfunctioning adenomatous goiter. Therefore, before Lugol's solution is used, a correct differential diagnosis must be made.

The use of Lugol's solution in cases of exophthalmic goiter before operation has decreased the intensity of the postoperative hyperthyroid reaction so much that preliminary ligations are needed less frequently, and at the same time there has been a marked lowering of the surgical mortality rate. As Pemberton has reported, the surgical mortality is now reduced to 1 per cent, if based on the number of operations, or to 1.7 per cent if based on the number of patients.

NO SCARCITY OF PHYSICIANS

The decline of the country doctor is not due to the temporary decline in the annual output from the medical schools, or a scarcity of physicians in general. This country, indeed, has a generous supply. In 1921, as shown by reliable statistics, there was one physician in the United States for every 726 people, as compared with one physician for every 1,041 people in the British Isles in the same year; and, just before the World War, one to every 1,940 people in Germany, one to every 2,020 people in Austria and one to every 2,824 in France.—*A. M. A. Bulletin, Dec., 1923.*

OBSTETRICS AND THE GENERAL PRACTITIONER*

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In presenting this paper I feel that I shall not be able to give you much that is new, but I have made an attempt to summarize, as briefly and clearly as possible, those underlying principles that should be adhered to by every physician who does obstetrical work, whether he be specialist or general practitioner. It will apply particularly to those in general practice, and especially to those practicing in the country districts. First, because these men have, as a rule, been slow in adopting the new and improved methods in obstetrics; second, because these are the men who do the great bulk of our obstetrical work; and third, if the many advancements that have been made in obstetric practice in recent years are to reach the big majority of the people they must be carried out by the general practitioners.

I shall limit my remarks, not to the discussion of any special phase of obstetrics, but rather to the general management of the obstetrical case from the time of gestation through the puerperium, pointing out the importance of prevention, if possible, of abnormalities and pathologic conditions by careful observation and treatment during the prenatal period, and the detection of existing abnormalities and early treatment of same. I shall, likewise, touch upon the proper conduct of labor; the care of the child during and after delivery; and the care of the mother during the puerperium.

Obstetrics and infant care is a timely topic. Congress in 1921 recognized its timeliness and its importance when it passed the Sheppard-Towner Act, which is "An Act for the Promotion of the Welfare and Hygiene of Maternity and Infancy." The Children's Bureau at Washington, The American Child Hygiene Association, and other associations, have been organized for similar purposes, and all over the country, especially in the larger cities, clinics have been organized for prenatal care. The one great object of all these organizations is to reduce maternal and infant mortality, to reduce maternal and infant morbidity, to relieve the suffer-

*Presented before the annual meeting of the Minnesota State Medical Association, St. Paul, October, 1923.

ings and hardships of motherhood, to strive for a healthy and vigorous offspring, and to be mindful, not of the period of gestation and delivery alone, but of the years that lie ahead, so far as the physical welfare of the mother and child are concerned.

The great aim of medicine, in general, is to prevent ills, to cure ills, to alleviate suffering, to preserve and prolong life, and to promote through education and otherwise the welfare of humanity from the standpoint of upbuilding and preserving health. As obstetrics is the most important phase in medicine that a physician meets with, surely his aim in doing obstetrical work must be nothing less.

The maternal mortality rate in the registration area of the United States, at large, is 6.8 per 1,000, while the bureau of the census on mortality statistics shows that over 86,000 infants less than two weeks of age die annually as a result of conditions existing before they were born, or of injuries and accidents at birth, and 100,000 are still-born.

In 1920 there were in the U. S. A. 16,320 maternal deaths from puerperal causes, and 5,616 of these were due to puerperal septicemia. De Lee estimates that 8,000 mothers die annually from puerperal infection, and he speaks of puerperal infection as "a humanly preventable disease"—preventable, as can be seen from the fact that well conducted maternities frequently care for thousands of cases in succession without a single fatality. In maternal death rate the United States ranks twentieth in the list of civilized nations.

The obstetric dispensaries of the large cities of our own country, as well as those in the cities of foreign countries, care for the mothers in their homes at the time of delivery, often amid the least favorable hygienic conditions imaginable. And, yet, these dispensaries, too, care for thousands of cases successively without a fatality. And the prenatal care of the maternity hospital or the obstetric dispensary can be carried out by the general practitioner, and the aseptic technic at the time of delivery can be carried out by him at the homes, even the very poorest homes. And where this has been done the results have been most admirable. The maternal and infant mortality rate among those cases managed by the general practitioners is considerably higher than that in the maternity hospitals and obstetric dispensaries. The deaths among child-bearing women can be reduced by at least 50 per cent with the proper care during the prenatal

period, during the delivery, and during the postpartum period.

The prenatal clinics of the city can hardly be maintained in the country districts, but the principle of these can be carried out by the family doctor. But the family doctor must be willing to spend a little extra time and effort in so doing. A regularly licensed physician should be in charge of every obstetrical case, and the old idea of seeing the patient at the time of delivery only and then arriving at the bedside only after the perineum is bulging and the head about to deliver is obsolete and should be ancient practice. The patient should be seen just as soon as she realizes that she is pregnant. And she should be given the benefit of every modern advancement in obstetric care throughout gestation. It is a slow process to have any reform in medicine accepted by the laity. But, as a rule, all mothers are desirous of good health and healthy vigorous offsprings, and time and persistent effort will teach the mothers to come to the doctor for information, and to come early. Mothers are beginning to recognize good obstetrics and they are beginning to demand what is their just right in this respect.

Every mother bearing children deserves the best care that the medical profession can give, and this should be rendered from the time gestation takes place until after the puerperium. The careful prenatal care given the mothers at the prenatal clinics of the city can be given fully as well, by the family physician, to the mothers in the country.

To a great majority of the people prenatal care is a new phase in medicine, and it takes time and effort to educate them to realize its value. But the barriers are clearing gradually. In late years one of the greatest factors for good in educating the public has been the county nurse, and in conjunction with her work the distributing of the valuable literature published and sent out gratis by the State Board of Health and by the Children's Bureau at Washington. Among the publications that I make most frequent use of are the monthly prenatal letters sent to expectant mothers by the State Board of Health; "The Care of the Baby," by The United States Health Service; "Prenatal Care" and "Infant Care," by The Children's Bureau at Washington, and "Motherhood," by The American Child Hygiene Association. And in most of the homes this literature is carefully studied.

Prenatal care is the basis of good obstetrics.

According to a statement made by Dublin in 1920 the maternal and neonatal mortality in New York City and Boston has been reduced more than one-half as a result of intensive prenatal care. And this work as it is conducted at the clinics of most of our large cities can be carried out in the country districts. Maintaining a clinic would be unnecessary as well as impractical, but the care that the clinic affords can be given by every conscientious practitioner. The principle of all prenatal care is, first, to care for the mother, and, second, and fully as important, to educate the mother. The careful conduct of labor, employing the best of technic and observing all rules of asepsis and antiseptis, is important, and this is a great triumph for preventive medicine. But prenatal care is of even greater importance. Guide a mother safe and

sound up to the onset of labor and the battle is more than half won. Our only hope in the management of the toxemias of pregnancy, deformed pelves, etc., lies in the conscientious and intelligent management of the patient prenatally.

The expectant mother must come to the physician early, and at this first visit a complete physical examination should be made. The teeth, the organs of digestion, the chest and cardio-vascular system, the kidneys, the breasts and the nipples should be carefully examined. A vaginal examination should be made, and the common pelvic measurements should be taken to determine whether the case falls into the normal group or is one of the occasional abnormal pelves that will require special attention later in pregnancy. At this first visit, too, the pregnancy record should be filled out.

PUERPERIUM

MOTHER										CHILD				
DAY	Temp.		Pulse		Resp.		Bowels	Bladder	Lochia	Breasts nursing	Umb.	Eyes	Bowels, Bladder	Wt.
	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.								
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														

Remarks:

Physical Exam. 8 weeks after delivery:

Mother:

Child:

LABOR

Date of Delivery.....
Hour.....

No.....
Name Address

Pains Began.....Temp.P.Resp.

Vag. Exam.....Rectal Exam.

1st Stage.....2nd Stage.....3rd Stage.....Total Duration

AnesthesiaAnesthetist

Membranes Ruptured: { Artificially.....Time.....
 { Spontaneous.....

PresentationPosition

Placenta: { Manner of Delivery.....Membranes

{ Condition ofPerineum

Operation

HemorrhageMedication

Action of Uterus after Delivery.....

Child: Condition.....Resp.....Sex.....Wt.....Eyes.....

Temp.....Pulse.....Resp.....(1 Hr. Post-Partum)

Complications and Remarks:.....

Note: The record cards used for the puerperium and for the labor are 4 inches by 6 inches in size. The record of the puerperium is kept on one side of the card and the labor record on the other side.

Careful record should be made of the patient's menstrual history, the patient's previous pregnancies, previous labors, previous puerperiums, etc. The physician can readily devise his own record card for this purpose.

If at this first examination everything is found normal the patient is instructed to return at least once a month up to the seventh month. A definite date is set for her return. At these visits the blood pressure is taken, and the urine examined, and an inquiry made into the patient's general condition. If the patient is unable to come in from the country, because of the weather or the roads, she is given a bottle in a mailing case with a preservative in the bottle, and the specimen is mailed in.

From the seventh month on the examination is made every two weeks, or even every week if thought necessary. The patient must at once report to the office if any untoward signs or symptoms develop, such as headache, dizziness, eye symptoms, abdominal pain, swelling of the feet, puffy lids,

etc. The most careful attention is paid to the care of the breasts in order that the mother may nurse the baby if possible. The importance of breast feeding is impressed upon the mother.

Considerable freedom can usually be allowed in the diet during pregnancy. Any sensible diet that was suitable to the mother before she became pregnant will in most cases be suitable during gestation. Foods that cause digestive disturbances should be avoided during this time as well as at other times. Within the bounds of good sense the mother can safely follow the dictates of her appetite as to her choice of foods. Certain general principles, however, must be kept in mind: first, the accumulation of waste products in the body causes numerous minor as well as some of the more serious ailments of pregnancy. The mother must throw off the wastes produced by the fetus as well as those produced by herself. The excretory organs—bowels, skin and kidneys—must therefore be kept in the best possible condition. It is most

GENERAL PHYSICAL EXAM.

Date.....	Height	Wt.....
Stature	Throat	Teeth
Nose		
Lungs		
Heart		
Breasts	Nipples	
Abdominal Exam: Fundus.....	Position	
Presentation	Fetal Heart	
Measurements: SP. I.....	CR. I.....	BI. T..... DB.....
Vag. Exam.: Perineum.....	Cervix	
Cervical Canal	Presentation	
Position	Estimated Vera.....	Outlet.....
Varicosities	Edema	
Diagnosis:		
Remarks:		

PREGNANCY

No.....	Date.....	Expected Labor.....
Name	Add.	Tel.....
(Nurse	Add.	Tel.....)
Age.....	Nationality	Para.
Family Hist.		
Personal Hist.		
Marital Hist.		
Menst. Hist.		
Last. Menst.		Quickening.....
Previous Preg.		
Previous Labors		
Previous Puerp.		

Note: The cards used for the general physical examination and for the pregnancy record are 6 by 8 inches. The upper half is used for the physical examination and the lower half for the pregnancy record, while the back of the card is used for the pre-natal records of the urine, blood pressure, treatment, etc. This card is folded along the middle and with the other record cards can be filed in a 4x6 filing case.

important that liquids form a large part of the diet during pregnancy, as these aid the excretory organs in eliminating the body wastes. The patient should take at least six glasses of water and an equal amount of sweet milk, buttermilk, soups, cocoa, and chocolates, combined, during the twenty-four hours. Second, a laxative diet must be adhered to in order that constipation and intestinal stasis may be prevented. Third, the diet must have the necessary nutritive value and be well balanced that it may keep the mother in good strength and health. A general rule regarding the mother's diet, then, would be: Large amounts of liquids and fresh fruits and vegetables, and small amounts of meats and other proteins, the latter not to be taken more than once a day. Several lighter meals a day are to be preferred to three heavy ones, and a glass of warm milk at bedtime is to be recommended.

General information is given the mother regarding dress, bathing, exercise, and preparations for delivery (that is, the supplies needed for herself and the baby at, and after, the delivery). She is told what she may expect during pregnancy and delivery. Especially in primipara do we find much anxiety and worry, and these should go to the doctor for information, rather than to relatives and friends.

An abdominal and vaginal examination is made two weeks before the delivery to make sure of presentation and position, and thus vaginal examination at the time of the delivery is usually unnecessary.

If a physician has succeeded in guiding the patient safe and sound up to the onset of labor the battle is more than half won. But it is by no means over. It is in the delivery room that one must exercise exceptional care and use his best technic. The careful aseptic and antiseptic technic used in the outpatient departments of our large hospitals, and in the obstetric dispensaries in the cities, during the time of delivery, can be practiced as well by the man in general practice.

There is a growing tendency for mothers to go to the hospitals to be confined. In the cities, especially among the well-to-do, this is an easy matter. When the labor pains set in an ambulance can be called and the patient is in the hospital in a few minutes. In the country districts it is quite different. Even in the city there are many mothers who cannot go to a hospital to be delivered. This is even more true in the country. In fact very few

of the mothers in the country can conveniently be taken to a hospital; hence, we must bring the hospital to her. Furthermore, I feel that the mother belongs at home at the time of confinement. And whether she is at home or in the hospital she merits the same careful attention.

When called to a case it is better that the doctor arrive several hours ahead of time than that he arrive only ten or fifteen minutes before the baby is born. He can do better obstetrics and it saves the mother and the rest of the family a good deal of worry and grief. If done conscientiously obstetrical work is the hardest work that a physician encounters, and it is also the most important. When called to a case he must, for the time being, forget about his other work. If too busy to give the necessary time and careful attention to a case he better not take it, but turn it over to someone who is willing to take the time.

In the country and in the village, as in the city, the doctor comes to a great variety of homes. It is sometimes against odds that one must work in the delivery chamber. And it is not always possible to carry out one's aseptic hospital technic to the *n*th degree. But, whether the homes be rich or poor, one thing is certain—one can have the use of fire and water and soap. And the proper use of these goes a long way in doing good obstetrical work in the delivery chamber. Add to these a couple pairs of good rubber gloves and a finger-nail brush and one has the major part of his necessary equipment. And, if one combines with this equipment good judgment and an endless amount of patience and "watchful expectancy," and abstains from interference of every kind, he is doing a great deal toward reducing maternal and infant mortality.

In my obstetrical bag I carry everything that is needed for any ordinary case, as well as the things needed for any abnormality that can possibly be handled with safety outside the hospital. This equipment includes among other things an ample supply of sterile linens. Besides the linens done up in smaller bundles and which are carried mainly for emergency use, I have my so-called obstetric bundle, which contains the following articles: Two large sheets, two doctor's gowns, one pair obstetric stockings for the mother, a dozen towels, dressings for the cord, tape, and a few dozen gauze sponges. These bundles have previously been carefully wrapped and sent, ten or twelve at a time, to a

nearby hospital, where they have been sterilized. When I arrive at a case the bundle is ready for immediate use. I also carry two six-quart basins in which I boil water for lysol and bichloride solutions, and one four-quart basin which is boiled with my other instruments. This sterile basin is used for receiving the afterbirth.

As I said before, if a vaginal examination is made two weeks before labor sets in, it is very seldom necessary to do a vaginal examination at the time of delivery. And by avoiding vaginal examination at this time a great source of danger from infection has been eliminated. When labor sets in a careful examination should be made in every case, but this should be abdominal and rectal. I find the necessity of doing vaginal examinations in less than one out of twenty cases. There is no time lost in making rectal examinations and time is often valuable. A non-sterile glove lubricated with vaseline is all that is needed. No matter what precautions are taken in doing a vaginal examination there is ever the danger of infection, as the vagina and entrites reek with virulent bacteria of many kinds. And once a vaginal examination has been done abdominal section and pubiotomy, if later found necessary, are out of the question.

In preparing the patient for the delivery the pubis and labia are clipped and washed with soap and water. A rubber pad covered with a clean sheet is placed underneath the patient.

Shortly before the end of the second stage the vulva, pubis, lower abdomen, medial sides of the thighs, the perineum, buttocks, and anus, in the order named, are painted with half strength tincture of iodine. The doctor sterilizes his hands and he places a large sterile sheet under the patient. Sterile stockings reaching to the hips of the mother are used, a large sterile towel is placed on the abdomen and a folded towel over the vulva. The doctor again sterilizes his hands, and puts on sterile gown and gloves. For this work the hands and forearms are sterilized as for a major surgical operation. One basin of a 1 per cent lysol solution and one of 1:1500 bichloride solution are at hand for frequent rinsing of the hands. An attempt must be made to keep the field just as sterile as if it were a case of major abdominal surgery, and the patient must be handled with just as much consideration and care. Obstetrics rightfully belongs in the class with surgery, and the parturient woman

deserves, and she should enjoy, the same careful consideration that is enjoyed by a case in major surgery. The hands cannot be made absolutely sterile, nor can the vaginal tract and the vulva be made sterile. Hence undue examination and interference must be avoided. The environment in general must be as clean as possible and the doctor and the patient must observe the most rigid principles of asepsis and antisepsis. When these precautions are observed one is doing as much for the protection of the mother as can be done in a well equipped hospital. To be sure, in spite of all one's care, the bed and sheets and stockings will soon be more or less contaminated by the mother, especially in long drawn out labors. But, nevertheless, they give a great degree of protection, and, furthermore, the abdominal towel and the vulvar towel can be frequently replaced by sterile ones, and these towels only are touched by the physician's hands throughout the delivery. The vulva and the perineum are wiped off frequently with sterile sponges soaked in 1:1500 bichloride solution.

It is when we apply promiscuously the newer methods for shortening the second stage of labor in normal cases that we raise the maternal as well as the infant mortality rate. We co-operate with nature most by waiting and giving her a chance; and if she fails, and we must interfere, our percentage of success will be greatest when we resort to the least radical form of interference possible. Many of the ordinary complications met with during labor will be righted by the process of nature if we watch and wait, and much more safely than if we resort to radical measures of interference. To apply forceps without real indications (that is, failure of the powers, or danger to the life of the mother or the child), or to use pituitrin carelessly, is criminal.

Ether anesthesia is used in all my cases. When properly given it controls the pains perfectly. When the head is about to escape from the vulva the first stage of surgical anesthesia is reached and the head delivered without pain to the mother. At the end of the second stage the mother, if she is a primipera, lies in the Sims position, as perineal lacerations can best be avoided in this manner. During the progress of labor DeLee's head stethoscope is used, and the condition of the fetal heart observed at frequent intervals. Special care must be taken in this respect toward the end of the second stage, and should signs of asphyxia in the

child develop one must be ready for immediate delivery.

The child, as soon as delivered, is placed on a sterile sheet. The eyes are at once wiped dry, each with separate sterile sponges. The sponges may be soaked in the bichloride solution. The mucus is wiped from the mouth, and where there is any indication of mucus in the pharynx and trachea it should be aspirated by means of a catheter. The cord is tied and the stump dressed in a sterile manner like any clean surgical wound.

During the third stage, as in the second stage, one must practice watchful expectancy. Manual delivery, whether by internal or external manipulation, adds distinct risk. The mortality rate resulting from accidents of the third stage is greater than that of the first and second stages combined. One's object must be to avoid post-partum hemorrhage and to deliver the placenta and membranes complete. One must give proper time for the placenta to separate normally and interfere only when necessary. On the proper conduct of this stage depends the uninterrupted puerperium, and the health of the mother in later life may be dependent upon it.

The separation of the placenta takes from fifteen minutes to half an hour. When one is certain that the separation has taken place he may aid the delivery of the placenta in one of two ways: First, the recti muscles may be grasped in the hand and held together above the fundus of the uterus, and the mother told to bear down; or, second, the uterus may be grasped by the whole hand and gently pressed down. If not effective the first time the process is repeated at ten minute intervals. If, after one hour, the placenta fails to come away by this method Crede may be used. At times it is necessary to wait an hour or even several hours for the separation. During this time, of course, the patient must be under observation. I have occasionally waited five or six hours, and I once waited twenty-three and one-half hours; in which case there was no hemorrhage. The placenta came away spontaneously, and there were no untoward symptoms afterwards. By hurrying this stage one interferes with the normal mechanism of separation and expulsion, and this is the commonest cause of retained placentas, in whole or in part, hemorrhage and infection.

If possible the cases should be seen daily for several days after the delivery, and the mother and

the child should both be carefully examined at each visit. Even in the country though the patients be ten or fifteen miles away they should be seen on the third and fifth days post-partum, if roads and weather conditions permit.

I require all my obstetrical patients to report to the office eight weeks after delivery for the final examination of both mother and child. No charge is made for the prenatal care nor for the post-partum calls.

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DISCUSSION

DR. J. C. LITZENBERG, Minneapolis: I long ago made a vow that whenever I discussed a paper I would never say: "We are to be congratulated upon listening to the doctor's excellent paper." It is absolutely impossible for me to avoid that, and I must retract. I have never heard a paper in my obstetric experience that has given me as much satisfaction as this one, not because it contains so much of the teaching of the department at the University of Minnesota, but because a man better fitted to tell the general practitioner what he can do has read the paper. I have been invited into the country districts to talk to the doctors about the practice of obstetrics in country districts. That was the subject of the last paper that I read at Alexandria. I overheard some remarks, and I presume many of them were made that I did not hear: "Well, what does he know about obstetrics in country practice?" And I knew that was true. I simply had a theory that the country practitioner could practice good obstetrics in the country, and the fact that he was in the country was no reason why he should not practice it. But that was the theory of the teacher, and many of the men would smile and say: "Oh, well, he has his hospital and he has his nurses and he has his assistants and he does not know anything about our problems."

Hereafter if I am invited to give such a paper in the country districts of the state of Minnesota, I shall tell them to get Dr. Bergheim, of Hawley, a village of about twelve hundred people—and he knows more about the practice of obstetrics in country practice than I ever dreamed of. I have been preaching this gospel for a good many years and I have insisted that it could be done. Now a man who has done it has come before this section and proven it. With Dr. Bergheim's permission his paper will be incorporated in the lectures at the University of Minnesota as a proof that a country practitioner has demonstrated that these things can be done in the country. The country practitioners think I do not know anything about it because I never practiced in the country. And I think they are right. But Dr. Bergheim knows and he is putting into practice in a rural community the principles of as good obstetrics as any city enjoys.

I am having a little difficulty in not waxing overenthusiastic about this. You know when you have suffered and sweat blood over certain things, it does you good to hear your position supported, and especially by a country practitioner in a town of only twelve hundred people where they are getting as good obstetrics—if I may be permitted to say it—as they are in Minneapolis or St. Paul. It is certainly a great satisfaction to me to hear a country doctor preach the doctrine that prenatal care can be carried out in the country, in spite of the fact that they have not the dispensaries.

There is one very significant sentence in his paper, and that is: "Prenatal care and aseptic obstetrics can be carried out in the country as well as in the city." The doctor even mentioned the care of the teeth and the breasts! Who ever heard of such a thing—a country doctor talking about the care of teeth and breasts in country practice! And he has told us just how to do it and do it right.

In closing may I remind you of the doctor in Dixon's novel that was popular a decade ago, "The Leopard's Spots," in which the country doctor was depicted as a man who didn't look upon his practice as a business but as a calling. A man who is willing to give the time, patience and devotion to an ideal in the practice of obstetrics in the country as Dr. Bergheim has been doing is a man who looks upon his profession idealistically, as a calling and not only a business.

DR. W. E. RICHARDSON, Pipestone: May I speak for the country doctor just a moment? I know Dr. Litzenberg didn't mean to slam the country doctor particularly, but he certainly did when he said, "Who ever heard of such a thing—a country doctor talking about the care of teeth and breasts!" I graduated from Rush in 1896, and I have always taught the mothers to be careful of their teeth and breasts.

DR. J. C. LITZENBERG, Minneapolis: I put you in a class with Dr. Bergheim.

THE CHAIRMAN: I think that Dr. Litzenberg in his enthusiasm overstepped a little. I do not think he meant to cast any aspersion on the country doctor at all.

DR. W. A. COVENTRY, Duluth: I have enjoyed this paper very much. Dr. Bergheim has incorporated in it, as Dr. Litzenberg has said, a great many valuable things. One thing that he mentioned in the paper is to my notion very valuable, and I have carried it out for a long time, and that is to have a strictly obstetrical grip in your car or in your office. In fact, I keep one at home and one in the office so that I can always have it handy. In that grip everything that you need for an obstetrical case is sterilized and wrapped in separate packages, so that when you get to the home you do not have to depend upon the kitchen fire

or anything of the kind for your sterilization. You have everything with you. That has been a very great aid.

I did not hear in the doctor's paper anything about the postnatal care. This to my notion is just as important as the prenatal care. The patient should be examined five to six weeks after confinement, and during that interval the patient should have, according to my notion, knee chest position or something on that order, to see that the uterus properly comes back to its right position. If it does not the use of the pessary post partum is a very valuable aid in helping to do so.

DR. M. C. BERGHEIM, Hawley (closing): In answer to Dr. Coventry's remark I might say that I mentioned that I examine the patients eight weeks after delivery, the mother and the child both. I brought that out a little more in the paper that goes in to the publishers, but I had to read more or less of a summary of the paper now.

In regard to the obstetric bundle: as I said, I have everything in this package—everything that is needed for a single case—and this one large package is wrapped several times in sheeting so that it cannot be contaminated. I make up about ten or twelve of these packages and send them to a hospital to be sterilized. They do this free of charge and they are prompt in sending them back. When I come to a case the package is ready for immediate use.

It might be brought out too that this prenatal care adds quite an additional burden to the general practitioner's work; but if you have definite days when these patients return to the office—even if you have from thirty to fifty of them booked up as much as six months ahead of time—you can manage the work very nicely if you have them come on definite days. I tell them that they must not come on Saturdays because those days are full enough anyhow.

I want to thank Dr. Litzenberg for discussing my paper.

"BUSINESS" AND "COMPETITOR"

There seems to be an increasing use by physicians of the term "business," when referring to their individual work in the practice of medicine, and of the term "competitor" when referring to their professional associates. This is unfortunate and unwise. If physicians regard the practice of medicine as a business, certainly the public will so regard it. If physicians look on other physicians as competitors struggling for "business," the public will surely regard all physicians in that light. The consequence will be that physicians and public will soon be employing all the tricks of "business" to gain for these respective groups the financial advantages which they may think are to be obtained from the application of sharp "business" practices.

Medicine is a profession, with traditions and ideals. The real physician is a professional man, who believes in and upholds the ideals of his profession. A profession which forgets its traditions and ideals will quickly cease to be a profession and will degenerate into a business. A true physician is one who is inspired with a "lust for scientific truth" and with an earnest desire to apply the demonstrated

facts of scientific medicine for the good of mankind and to carry its beneficial service to all those who need its ministrations. There is more to him than merely a knowledge of medicine and a college degree. He looks on men of his kind engaged in the practice of medicine as professional associates and brethren. There is no talk on his part of his "business" and his "competitors." He puts a just value on his services to those who can pay and expects and demands payment, after striving to give the very best service of which he is capable. To those who cannot pay, he renders the same sort of service, promptly and cheerfully, without regret that his work will not receive financial reward.

It is easy to see how one not possessed of the qualities of the true physician can look on the practice of medicine as a "business" and consider others engaged in it as "competitors." It is just as easy to see how and why such a member of the profession can and may degrade it in the eyes of the public, until the public comes to look on medicine as a business rather than a scientific profession whose followers are fired with a spirit of helpful service to men.

—A. M. A. Bulletin, Nov., 1923.

CLINICAL FEATURES OF EXTRA-UTERINE PREGNANCY*

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Pregnancy outside the uterus is a condition of comparative frequency. It may occur in the ovary, peritoneum of the abdominal wall, or any part of the tube. Clinically, we deal almost always with some type of tubal pregnancy. An ovarian gestation is a comparatively rare occurrence (less than sixty authentic cases have been published). A primary peritoneal pregnancy is so rare that all cases have been questioned, although Gröne reports a case in which the fertilized ovum had been implanted upon the peritoneum behind the right round ligament.

Last spring I reported the results of a study of twenty-five cases of extra-uterine pregnancies at St. Mary's Hospital during the years 1921 and 1922, in which ectopic pregnancy entered either in the working or final diagnosis. In this series twenty were operated, eighteen of which the microscopic or macroscopic findings proved to be primarily some type of tubal pregnancy. The other two were hemorrhagic ovarian cysts with free blood in the abdomen. Of the eighteen, fourteen were diagnosed either as ruptured or possible ectopic before operation. Other working diagnosis or diagnostic impressions with or without ectopic were: three threatened abortions, three hemorrhagic or ruptured ovarian cyst, two salpingitis, two pelvic abscess, one acute appendicitis, one acute abdomen with possible perforation in the gastro-intestinal tract, one retroversion of the uterus with metrorrhagia and one abruptia placenta. One case was operated twice within seven months: first a ruptured right tubal, second a left tubal abortion. There were thirteen ruptured tubal pregnancies, five tubal abortions and one secondary abdominal pregnancy of four months' gestation, primarily a right tubal. Pregnancy took place fourteen times on the right. Three had previously been operated for tubal pregnancy on the opposite side. Three died, two on the operating table and the other thirty-six hours after the operation. All three could probably have been saved if timely decision

to operate had been made. The period of gestation, six weeks to four months, averaged nine weeks.

The first and most important factor in the diagnosis of extra-uterine pregnancy is a most careful and complete history. This was generally found to be true in the cases where the pre-operative diagnosis was confirmed by the post-operative findings.

There is a strong presumption of pregnancy when a healthy adult woman, who is usually regular, passes over the expected date of her period by several weeks, along with this develops mammary changes and complaints of morning sickness. (Only in twenty-five to thirty per cent of tubal pregnancies do we find irregular bleeding at or before the time of the first period following conception. This happened in two of my cases, which I will report later.) Polak in a recent study of 307 ectopic pregnancies brings out this point, that tubal pregnancy occurs most frequently where there is a history of previous inflammation of the tube, premenstrual dysmenorrhea or a congenital anomaly. The first symptom of irregular bleeding should put us on our guard. Let us briefly consider the relation of the pathological processes to the physical signs.

FIRST STAGE

Intramural Extravasation or Before Internal Hemorrhage.—Tubal bleeding is due to the unstable position of the ovum owing to the imperfectly developed tubal decidua and erosion of the ovum, which apparently has a pseudo-malignant property of destruction of tissue, into the underlying muscle. This intramural extravasation produces such ovular unrest as to cause tubal distention and peristalsis, consequently the uterine contractions with bleeding and the milder colicky pains which precede the more severe pains of the passage of blood into the peritoneal cavity. The growing ovum with the bleeding into the tissues causes the tenderness over the distended gestation sac.

The impregnated ovum produces the amenorrhea, stimulates a decidual reaction throughout the mucous membrane of the tube of a group of cells, which is not a true decidua at the site of implantation, although it may be found in other parts of the tube, as well as in the opposite tube. The uterus is enlarged, because of a decidua prepared for the reception of the ovum. Congestion is present, due to the pregnancy, and this accounts for the

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slight softening of the cervix. It is generally supposed that when the ovum implants itself, it rapidly sinks below the mucous membrane into the underlying muscle; the destructive action of the trophoblast splits the muscle and opens the blood vessels, resulting in a hematoma or an extravasation of blood extending around the lumen of the tube or the length of it. This process is rather slow and inasmuch as we find the same kind of tissues in the uterus and tubes, the peristaltic wave is transmitted to the uterus, resulting in contraction with slight bleeding from the endometrium and mixed with this blood is the secretion from the hypertrophied utricular glands, which, as a rule, does not clot and is a characteristic sign. As the tube enlarges, the increased weight favors a prolapse of the tube into the cul-de-sac.

At this stage on making a bimanual examination, we find: (1) the cervix slightly softened; (2) bloody discharge, which does not clot; (3) cervix very sensitive to motion, due to the peritoneal irritation from the tubal enlargement or its prolapse, and to the reaction of the peritoneum covering the uterosacral ligaments; (4) pulsation of the uterine artery on the side of the gestation is more marked; (5) the uterus is slightly enlarged and may be displaced to one side, because of the tubal tumor; (6) Hegar's sign absent, except there may be softening in the interstitial type; (7) the tubal tumor is rapidly growing and very sensitive, because of the stretching of the peritoneal covering.

SECOND STAGE

After Internal Hemorrhage (Tubal Abortion or Tubal Rupture).—(a) A so-called tubal abortion may be and probably most always is a fimbrial rupture through the ostium or through a break in the tissues by the extravasation of the blood to the ostium outside the mucosa. The hemorrhage into the abdomen in this type is not as rapid and, therefore, attended with less shock. In a large series of cases reported by McDonald, it was stated that when the location of the ovum was noted, it was found in the outer third of the tube in 75 per cent of the cases and in the middle third in 15 per cent. The mortality after tubal abortion 1.6 per cent and the mortality after rupture 17 per cent. It is assumed that a large percentage of the ampullary and fimbrial gestations will end in abortion, many of which are not operated or much less diagnosed.

(b) In a tubal rupture or transperitoneal rupture the period of intramural extravasation may be

less and with only a few preliminary symptoms. The severe intraperitoneal hemorrhage, resulting in shock and collapse, generally is found in this type. The amount and rapidity of the bleeding determines the pulse frequency, drop in blood pressure and the leucocytosis. The effused blood becomes distributed over the general peritoneal cavity and tends to accumulate in the dependent parts; viz., the cul-de-sac and the renal pouches. If the bleeding is slow and the amount small it becomes walled off and we have the encysted type sometimes called a retro-uterine hematocele.

Primary abortion or rupture generally occurs before the eight week of gestation and usually means the death of the ovum, consequently the uterine hemorrhage is increased by the expelling of the decidua, either in mass or piecemeal.

At this stage of internal hemorrhage a differential diagnosis is sometimes hard to make between an ectopic pregnancy and an acute lesion of the abdomen. The history of a possible pregnancy or disturbed menstruation is most important and with it the findings present in the first stage if the patient has been under observation; plus the history of colicky pains followed with a severe sudden stabbing pain in region of the tubal mass; the presence of more or less shock; the peritoneal reaction resulting in a slight elevation of temperature and a moderate leucocytosis should help us to make a diagnosis before the tragic symptoms set in. On vaginal examination, we generally find the uterus displaced forward and elevated; it may be to one side and the rest of the pelvis filled by the effusion of blood, and, in the encysted type, the swelling elastic. It may be doughy in parts and the pouch of Douglas bulging. The encysted type should be diagnosed from (1) an incomplete abortion, (2) an inflammatory effusion, (3) an incarcerated ovarian tumor, (4) and a retroversion of a gravid uterus.

The following case reports are typical of conditions found in this stage:

Case 38,111. Admitted Aug. 14, 1921.

Working Diagnosis.—Ruptured ectopic pregnancy.

Final Diagnosis.—Ruptured right tubal pregnancy.

M. History.—Patient 25 years, married 5 months. Last menstrual period two months ago. Menstruation commenced at ten years; irregular, five weeks and sometimes missed a period; duration three to four days. Last period was normal.

P. C.—Pain in lower right quadrant commenced at 4 P. M., on the 13th; one-half hour later vomited. Saw patient at 6 P. M.

History of Onset.—Patient had noticed during the last week a slight bloody discharge. Had typical symptoms of normal pregnancy with slight nausea and vomiting developing two weeks ago. During the last week has had a few colicky pains and thought that she might possibly menstruate. On the day of onset the patient had felt normal and was doing her usual housework when she was suddenly taken with a sharp stabbing pain in the lower right quadrant.

Examination.—Patient well nourished, with the appearance of shock. Rigidity of muscles on right side. Tenderness general over lower abdomen, but more marked on right.

Vaginal Examination.—Cervix slightly softer than normal; marked pain on pressure; slight bloody discharge; uterus slightly enlarged and to the left. Right adnexa indurated and very tender to pressure. Diagnostic impression at this stage was an extra-uterine pregnancy.

At 8 P. M. I saw the patient again and the pain extended to the right upper quadrant with general tenderness over the abdomen; pain in upper quadrant, suggesting a typical gallstone colic; also, pain between shoulders. Temperature 98, pulse 90, blood pressure 100/70. At 6:30 A. M. the fourteenth, patient was brought to St. Mary's Hospital. Pain very severe and at times intermittent. The blood picture showed the following: Leucocyte count 16,300; hemoglobin 40 per cent; P. M. N.'s 74 per cent; temperature 98; pulse 100. Noon: Temperature 97, pulse 120, blood pressure 130/60. Vaginal examination showed bulging in the cul-de-sac, more marked on the right. At 3 P. M. operation; medium incision, abdomen and pelvis filled with blood, right tube found ruptured in middle third. Both ovaries and left tube found normal. Gall-bladder negative. Blood transfusion (450 c.c.) given as soon as hemorrhage was stopped; right tube removed, usual sutures and no drainage. On the 16th patient passed decidua in mass. There were no complications. Patient left hospital the 27th improved.

Case 40,822. Admitted June 8, 1922.

Working Diagnosis.—Tubal pregnancy (right) or cyst of right ovary.

Final Diagnosis.—Ruptured tubal pregnancy right.

M. History.—Patient 39 years, married; four previous pregnancies, second of which was tubal. Menstruation commenced at 14, regular 30 day; last, April 20th.

Complaint.—Uterine hemorrhage since May 21st; severe stabbing pains on right side, came on suddenly yesterday, was intermittent every three to five minutes, lasted two or three hours. Second attack at 4 P. M. today.

Vaginal Examination.—Cervix softer than normal; discolored, bloody discharge; uterus enlarged, size of two months' pregnancy; induration in right broad ligament, mass felt size of an orange. Left adnexa negative. No pressure in cul-de-sac. Pain present on moving the cervix.

Operation on the 9th.—Medium incision, free blood in pelvis, ruptured right tubal, mass size of small hen's egg, adherent (specimen sent to University Laboratory). Right tube and ovary removed. Usual sutures and no drainage. Patient left hospital June 20th, improved.

THIRD STAGE

Secondary abdominal pregnancy,—in this stage when the ovum survives a tubal rupture or abortion, the diagnosis is much harder to make and next to impossible without a complete history. The findings should show a cervix harder than that of an intra-uterine pregnancy. The uterus may be mistaken for the head of the fetus. A careful examination under anesthesia should be made and the passing of the sound, if necessary, to determine the depth of the uterus.

Let me give the history of one of my cases which falls into this group.

Case 41,753. First admitted Sept. 19, 1922.

Working Diagnosis.—Ectopic pregnancy or threatened abortion. (This patient gives history of previous left tubal pregnancy five years ago.)

History.—Patient 27 years old, last regular period July 2nd. On September 2nd and every day since has had more or less vaginal discharge with blood. Noticed nausea developing about the middle of August. September 4th developed vomiting, which has been almost continuous since.

Examination.—Cervix uteri discolored, soft, bloody discharge. Corpus uteri enlarged, size of two months' pregnancy. Soft and in anterior position. Right adnexa mass felt, doughy. The 20th, blood hemoglobin 88 per cent; leucocytes 9,300; P. M. N.'s 66 per cent; consultation, advised waiting. Patient was in the hospital eight days and gradually improved. Patient kept under observation at home and on the 17th of October uterus appeared symmetrical, patient feeling very much better and had hardly any nausea, although there was a daily show of blood. October 24th, 10:30 P. M., was taken with severe cramps, had indulged in large quantities of food, and on the 26th the patient was having intermittent pain every two to six minutes apart—sent to St. Mary's Hospital with a diagnosis of abruptio placenta and second inevitable abortion. Patient gradually improved until the afternoon of the 28th. Hemoglobin was down to 45 per cent, pelvic examination showed mass extending to umbilicus, symmetrical and a four to five months' pregnancy. Six o'clock patient was in shock, sent to the operating room, pulse 140 and becoming rapidly weaker. Passing a sound showed only depth of about 3.5 inches, cervix fairly firm and immediate laparotomy performed. A mass in the mid-pelvis in abdomen covered by omentum and large amount of bright red blood in pelvis and abdomen. Mass contained four months' fetus, 6.25 inches long and was well protected by omentum and adhesions of intestines. Patient did not recover sufficiently to take blood transfusion, which had been prepared. Patient died before leaving the operating table. Conclusion in this case was that the original rupture had taken place when seen in September and death of fetus did not take place, resulting in a tubo-abdominal pregnancy.

As we progress in the practice of medicine and our experience increases, we are more impressed by our mistakes than by our successes. Anyone

who has experienced the tragic and seen the fatal termination of an extra-uterine pregnancy can have but one answer to the method of treatment, when diagnosis has been made, and that is, operation immediately. Of course, I realize that there may be a few exceptions and I will briefly give them.

1. When a case is seen in the first three months of gestation and the patient is in shock, with the blood pressure low and the pulse thready, one may be justified in waiting until the reaction sets in, which may happen if you see the patient during or following the primary rupture. If there is a history of several sudden and sharp pains, followed by shock, then I do not think that you are justified in waiting. In all three cases that died at St. Mary's Hospital, there had been histories of repeated sharp attacks, followed by more or less shock, and if we wait long enough we will see the patient during her last and fatal hemorrhage.

2. If a diagnosis of extra-uterine pregnancy has been made and the case has passed beyond the seventh month, one may be justified in waiting until the fetus is stronger. An operation should be performed before patient goes into labor. The best method of taking care of the placenta in this type, is to leave it, unless the maternal attachment can be clamped off, as is sometimes found in the pedunculated ovarian type.

In an exsanguinated case give salt solution intravenously and follow with blood transfusion. Do not rely on the salt solution by rectum. I would suggest at the time of the operation that the free blood, found in the abdomen, be citrated and poured back into the abdominal cavity and not transfused, as we know that there is a rapid absorption of fluids by the omentum and peritoneum. Another thing to remember in a blood transfusion following an intravenous injection of salt solution is this, that it is not the quantity of the blood, but the stimulation caused by it that carries the patient over this critical period.

In regard to the advisability of removing the other healthy tube on the presumption that an ectopic pregnancy might develop in it at a later date, the answer should be "no," as there are more babies born following an ectopic than the number of ectopics. As a prophylactic measure in doing pelvic surgery and especially so in the Baldy-Webster, or Gilliam operation, avoid any angulation of the tube.

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DISCUSSION

DR. F. L. ADAIR, Minneapolis: The etiology of ectopic pregnancy is still clouded with considerable obscurity, and until we know more of course it will be difficult for us to prevent the incidence of ectopics. Undoubtedly certain physiological facts may be contributory causes to ectopics. This may perhaps be due in some instances to the time of the fertilization or insemination of the ovum.

Necessarily in an ectopic the ovum must be fertilized before it reaches the uterus. Whether it is physiological or not for it always to be fertilized before it enters the uterus, is still open to question. Perhaps in some instances when ovulation occurs late in relation to insemination, the fertilization of the ovum within the tube may be favored, which of course is a prerequisite for the occurrence of any ectopic pregnancy.

The work of Snyder in studying the changes in the tube indicates that the tube undergoes certain physiologic changes which correspond more or less with the changes in the corpus luteum; that is, the changes are more or less chronological. The inflammatory conditions of the tube have been spoken of as a definite cause of ectopic pregnancy. In a series of cases studied by Stein there was evidence of inflammatory conditions in the unaffected tube in about twenty-five per cent of the cases.

In this series he found no prolonged period of sterility preceding the ectopic pregnancy, which of course is an argument against inflammatory conditions being a very potent factor in the causation of ectopic pregnancy. He also stated—which has nothing to do particularly with the etiology, but is of interest in connection with diagnosis—that over fifty per cent of the cases were correctly diagnosed before operation. Following the theory of Sturmdorf, Magid suggests that a chronic endocervicitis is a predisposing factor in the causation of ectopic pregnancy by causing a perisalpingitis, which consists of an inflammation of the cellular tissue around the Fallopian tube. It seems to me perhaps a little more logical to think that the same underlying infection is the cause of both conditions, and that it is not necessarily the result of the endocervicitis.

It is unlikely that we shall soon be in a position to prevent the development of ectopic pregnancies. A thorough understanding of the underlying causes and the possible elimination of these predisposing factors might reduce the numbers of these cases.

The hope in the cases is from early and accurate diagnosis with prompt and effective treatment. A study and analysis of the clinical course and physical findings is of the utmost value. It is this which makes a presentation such as that of Dr. Weum's valuable to the clinician and also to the patients.

DR. A. MACLAREN, St. Paul: There are two points of which I want to speak. My experience in ruptured extra-uterine gestation cases is that abdominal section is necessary in probably ninety per cent of these cases if you are going to save the patient. The mortality in my experience has been in the neglected cases, and the ones that have been allowed to bleed into their own abdomens a number of times and the operation is delayed too long. The tear of the tube with intra-peritoneal hemorrhage very often comes at the time of the first missed menstruation. The fetus occasionally is killed by the tear. Then a pelvic hematometra usually forms in tubal abortion cases.

The first experience that I had, a great many years ago, was in opening one of these pelvic hematometra cases: a small pelvic hematometra, typical history of extra-uterine gestation with rupture and tear opening it. As we know, pelvic hematometra will often go on the formation of a pelvic abscess. If such a case is opened in the early stage of infection, the peritoneum is set on fire and the patient dies of acute septic peritonitis. After the early stage of infection had passed a number of cases were operated upon, by vaginal section and clamping the tube (as was just mentioned) and draining the pelvic hematometra, and the patient recovered.

Now when we open the abdomen occasionally we will find that the patient has had a tubal abortion. I believe that it is almost as reasonable to remove the tube in these cases as it would be to remove the uterus after an abortion. The danger of hemorrhage has passed. You have to deal simply with a pelvic hematometra. One of my patients who had only one tube and ovary was very anxious to have a child, and had a successful delivery after opening and cleaning out the tube as described above.

DR. L. W. BARRY, St. Paul: Ectopic pregnancy is not always easy to diagnose, but of course it is always easy to diagnose after you get in the abdomen. I think the most important factor in the diagnosis or the most important sign in the diagnosis of ectopic pregnancy is spotting. Practically all of the cases—ninety to ninety-five per cent—will give a history of disturbance of menstruation and spotting. They run all the way from two weeks to six weeks or two months, and some time in this interval begin to bleed. Usually the blood is not bright red as it is in the incomplete abortion or threatened abortion, with which ectopic is most usually confused; but the blood is dark and does not clot.

Now once in a while we have an inflammatory tubal condition. Especially where we have a flare-up of an old tubal condition we have spotting. Usually, though, the pain is on both sides and is not one-sided. Once in a while we have trouble in making a diagnosis between an ectopic and an ovarian cyst with a twisted pedicle. They have sudden one-sided pain; they go into collapse, have a slight temperature and slight leucocytosis. Once in a while we have difficulty in diagnosing between an ectopic and incarcerated uterus.

In the treatment of ectopic pregnancy I think the thing to do is to operate as soon as the diagnosis is made. Once in a while, of course, you will be called out in the country, and the patient has not consulted a doctor soon enough to be operated at the opportune time. She is in collapse. What are we going to do? If we have any instruments we should operate. Sometimes we take these patients to the hospital and they die on the operating table. Two of these that Dr. Williams reported died on the table. I think the thing to do is to transfuse before you operate and not afterward. I think it is a very poor plan to trust to salt solution. The patient needs blood now. Pouring the citrated blood back in the abdomen I think is a very good idea. Sometimes it is practically saved anyway, and you can leave it and absorb it without very much trouble. Some put ether in the abdomen—all of which are very good measures.

DR. W. A. COVENTRY, Duluth: I would like to draw the attention of the society to one thing that happened in my practice, and that is a question of induced abortion in extra-uterine pregnancy. Within the last year I have had such a case, she admitting having consulted a physician who committed abortion, or attempted to at least, on two different occasions within a week. The patient had an extra-uterine pregnancy of about three months' duration, unrecognized by the abortionist. The outcome was fatal because the patient had become infected. However, it brings up the point of not depending too much upon spotting, but depending more upon your physical examination and your bimanual examination.

Dr. Barry brings up the point of transfusion before operation. I believe it is better at the time of operation or immediately afterward. I think most of the blood that is put into the patient will be washed out if transfused before operation.

Then there is the question of operating on these life and death cases. You have to operate as fast as you can and do as little as possible. The thing to do is to stop your bleeding, close quickly, and get your patient to bed. Don't bother to wash out blood; don't bother to wipe out the clots; leave them alone. Babcock has made this suggestion: in desperate cases he goes through the cul-de-sac and grabs and clamps the bleeding tube, stopping the bleeding, and getting the patient off the table and into bed, thus not unduly shocking an already badly shocked patient.

DR. V. J. HAWKINS, St. Paul: I haven't very much to say, but the whole thing with tubal pregnancy is to make a diagnosis at once and operate at once, and you will save all of your patients. It doesn't make any difference where you are. If you carry out ordinary asepsis, if you are ordinarily careful, you will save every one of them. You say that is not the right way to get at the question, but this thing of waiting and making all sorts of blood tests is fatal. The diagnosis is practically made every time, on the passage of blood and mucus that does not clot. It looks like coffee grounds, only that it is black. And with the history and the possibility of pregnancy it is safer to open the abdomen in a hundred patients than it is to get down to fine diagnosis. We have had at least twenty cases in the last seven years without a death. One of those cases came to us after they had been told that there was no use

of attempting to do anything, no use to take it to the hospital. Extreme prostration or shock. Put patient on the table, clamped off the tube and removed it and closed her up, and she got well. We didn't make any transfusions or anything of the kind; didn't fool around with anything. Go at it like you did with appendectomy thirty years ago. Go right at it. Fool around and you are going to lose them every time. It doesn't make any difference how they were in the beginning, if you wait to see if that patient is going to die, the patient is gone.

DR. T. W. WEUM, Minneapolis (closing): Dr. Hawkins brought out the importance of not depending entirely on your blood findings. That is fatal, because as I stated in one of my cases, the hemoglobin was up to 88 per cent. There was nothing unusual in her early blood picture. I had seen that patient the afternoon before the blood picture was taken, and she was in shock. At that time I made a definite diagnosis of an extra-uterine. The next morning she was in the hospital. She was smiling and feeling good. And here was her blood count. The examination by another man indicated that it might possibly be an intra-uterine. The family thought there was no harm in waiting, and we waited eight days, and the patient left the hospital very much improved.

Those are the cases that we are fooled on. You have made mistakes; I have made mistakes. But let us profit by our mistakes. To show how easy it is to make a mistake: Last month I operated on a woman who was forty-one years old. Two years ago I had delivered her at St. Mary's Hospital. During the delivery I had felt a large fibroid of the uterus, the size of a hen's egg. There was nothing unusual in her menstrual history afterwards until about two months ago, when she started to menstruate and had an irregular menstrual flow for a period of four weeks. I decided to send her to the hospital. I knew that she had a fibroid, because I had felt it two years ago. She was a large woman, somewhere between two hundred and two hundred and fifteen pounds, and about five feet in height. You know how much you can feel in an abdomen of that size.

With this history of continued spotting and severe stabbing pain in the lower left quadrant on two different occasions and the uterus hard and slightly irregular like a fibroid uterus, I decided to send her in, and thought perhaps we could eliminate the possibility of malignancy by a diagnostic curettage. During the operation I found that the fundus was rather soft on curetting. The softness of the fundus decided what course should be pursued. We went in above and found this small fibroid uterus and also a left tubal pregnancy with free blood in the abdomen.

Now this was right during the time when I was writing this paper, and I should have been prepared, but although I thought of it, I didn't think it was possible. It just goes to show how you have to be on guard. Another thing that I wanted to bring out is that in the cases where you see them in shock, you will find the blood pressure low; and as the blood pressure goes up, say from ninety or a hundred to a hundred and thirty, that is the time to operate, as soon as the reaction sets in, because the clot is going to break again and you will have a second hemorrhage. Operate them just as soon as they make the curve.

A BRIEF REVIEW OF THE VARIOUS PHASES OF EPIDEMIC ENCEPHALITIS IN MINNESOTA FROM 1919 TO 1923 INCLUSIVE. (PERSONAL OBSERVATION OF 340 CASES) *

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In the editorial column of the Journal of the American Medical Association (March 10, 1923, p. 696) we read the following: "From the spring of 1920 until recently, there have been comparatively few new cases of epidemic (lethargic) encephalitis in North America, and interest in it has been kept up mainly by the surprising array of its somatic and psychic sequelae. Within the last few weeks, however, reports have come of a large epidemic in Winnipeg, and smaller ones in Connecticut and elsewhere."

The fact that our experience in Minnesota has been at variance with this, and because the 1923 wave of epidemic encephalitis has been more prevalent and more virulent than any previous one, is the main reason for again presenting this subject, about which over two thousand articles have been written in the past few years.

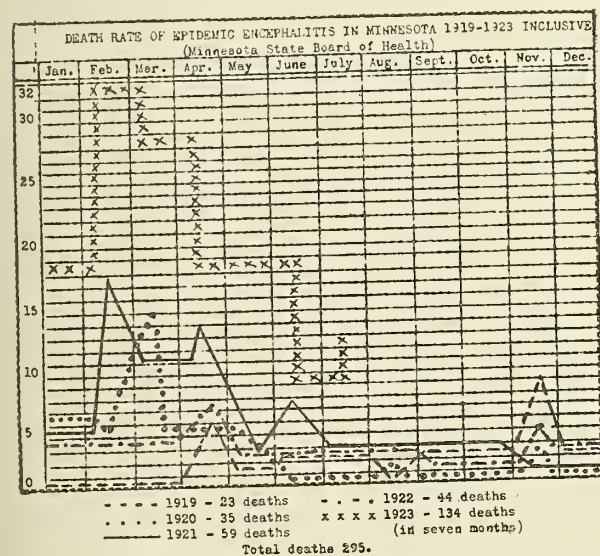
A statistical study, obtained through the kindness of the State Board of Health, reveals that from April, 1919, to July, 1923, inclusive, 295 deaths occurred in Minnesota from encephalitis; 134, or over 45 per cent of which were in 1923. The mortality rate, taken from the literature and from our own experience (a study of 340 cases), is approximately 17 per cent. Accordingly, about 1,735 cases of moderate or marked severity have occurred. And if we add to this number the abortive and extremely mild cases, with not sufficient symptoms to seek medical aid, it can be conservatively estimated that over 2,000 cases have developed in Minnesota alone since the spring of 1919. Judging from the literature, Minnesota has not been involved to a greater degree than the other states in the Union.

This brief statistical study gives us a conception as to the enormous number of cases which have occurred throughout the civilized world since the beginning of this protean disease in the winter of

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1916 in Vienna, from where the first cases were reported by Von Economo.

A study of the statistical chart shows that Minnesota has passed through four definite periods of exacerbations. In 1919 the greatest number of deaths occurred during the months of April and November. In 1920 there was a definite increase in the mortality during March—remaining fairly quiescent during the remainder of the year. A similar although greater death rate, occurred during the spring months of 1921. During 1922 the disease remained fairly quiescent, averaging less than four deaths a month. However, in the early months of 1923, a most marked exacerbation occurred and more deaths were reported during the first five months of this year than any two previous years combined. Similarly the number of cases which occurred was greater, the organism apparently more virulent and the disease in many of the fatal cases of shorter duration than during any previous wave.



This marked increase in the number of deaths reported during 1923 is due to three factors:

1. The organism seemed more virulent than at any time previous.
2. Because of the profuse literature on the subject, the medical profession had familiarized itself with the many varied and bizarre syndromes which this disease presents.
3. Some deaths were undoubtedly due either to sequelae or exacerbations in cases previously afflicted with encephalitis.

As is demonstrated in the statistical chart, epidemic encephalitis has shown a definite increase during the early spring period, over 52 per cent of the deaths occurring during the first four months of the year. This is in accord with the Monthly Mortality Rate of New York in 1920, where the greatest number of deaths from encephalitis occurred in February and March, 53 and 57 respectively. Furthermore, there has been a marked rise in the death rate in each subsequent year, 1922 excepted. This is of special interest, for in every known epidemic the virulence of the organism usually abates after having reached its climax. In anterior poliomyelitis, this has been partly attributed to the fact that one attack, even mild, produces immunity, and in all probability many abortive and extremely light cases, unrecognized, develop during an epidemic, a great aid in lessening the activities of the organism. In epidemic encephalitis a mild attack does not establish an immunity. On the contrary, it is not uncommon to obtain a history suggestive of encephalitis with improvement or even complete recovery, and some months or even a year later have the patient develop marked symptoms, definitely establishing the diagnosis. A case recently seen in consultation with Dr. W. A. Dennis, St. Paul, had a time interval of two months between the first manifestations and the final development of the disease. Another case, seen with Dr. L. S. Ylvisaker, St. Paul, had three definite exacerbations with marked improvement in the interval, during a period of six months. A third case, seen with Dr. E. B. Daugherty, of St. Paul, had an acute attack with diplopia, lethargy, temperature, bladder disturbance and delirium in February, 1920. This continued for six weeks to apparent recovery until June, 1923. Then he began to develop muscle rigidity and at present presents the typical Parkinsonian syndrome without tremor, not an infrequent sequel of epidemic encephalitis (an interval of over three years). A fairly large number of similar cases have been reported in the literature. These recurrences are probably not due to a re-infection but to a lighting up of the organisms present, similar to what occurs in syphilis.

Although epidemic encephalitis may develop at any age, the largest number of cases occurred between the ages of twenty-five and thirty-five. The oldest case in our series was sixty-nine years and the youngest case began five days after birth. This

little girl, seen in consultation with Dr. J. H. Libert, of St. Cloud, presented a most interesting picture. The family history was negative. The mother passed through a normal pregnancy and delivery. The child was well till the fifth day, when it had a convulsion, temperature 102 degrees, and became lethargic for ten days. It could be aroused for its feedings but readily lapsed into a stuporous state. About the twelfth day, it developed strabismus and gradually improved from the lethargy. Four weeks later it had a series of generalized convulsions with a moderate degree of temperature for five days. It gradually improved, developed physically but not mentally. It has never been able to walk or use its hands properly. At the time of my examination, the child was three years old. Her mentality was markedly impaired; she had a whining cry, but could not talk; certain noises, especially the ringing of the telephone, apparently terrified her; other, even loud, sounds did not seem to annoy her; she had internal strabismus; her upper extremities were awkward and markedly hypotonic; triceps, biceps and perist reflexes were normal. Her lower extremities were so hypotonic that her legs could be placed behind her neck without difficulty; her feet could be readily flexed so that the toes touched the anterior surface of the tibia; knee and Achilles jerks were absent; there was no Babinski. She propelled herself by rolling over and over sideways. At times, she seemed to take a little notice of bright objects.

As the mother was perfectly well during the entire pregnancy, gave no history of influenza or any other illness, one is at a loss to even surmise the source of the infection. The usual incubation period of encephalitis is given as ten days. Our youngster developed her first symptoms on the fifth day after birth.

Encephalitis complicating pregnancy is not infrequent. The mortality rate is surprisingly low and the effects on the newborn variable. Wechsler (investigation by the Association for Research in Nervous and Mental Diseases, page 11) reports 22 cases with four maternal deaths. In our series, one patient, seen in consultation with Dr. C. B. Teisberg, St. Paul, developed encephalitis at the fourth month of pregnancy, with marked myoclonic twitchings of the upper extremities, persistent tachycardia (120-140), profuse sweating, but gave normal birth to a healthy child at term. The termination of the pregnancy had no effect on the chronic manifesta-

tions in the mother. The child is developing normally in every way.

The literature so profusely covers the symptomatology with classifications, descriptions and case reports of this most protean disease, that it is needless to give more than a brief summary. Although multiple syndromes were observed during the entire period under discussion, more or less outstanding symptom groups occurred with each wave.

During 1919 and 1920, the predominant symptoms were: (1) pathologic drowsiness (lethargy); (2) cerebral nerve palsies—especially ophthalmoplegia; (3) acutely developing paralysis agitans syndrome (mask-like face; muscular rigidity); (4) pupillary changes; (5) bladder disturbances; (6) headaches.

In the early spring of 1921, when the third increase in the number of cases developed, the clinical picture changed somewhat and there was more evidence of meningeal irritation accompanied by profound toxemia. The outstanding syndrome was: (1) headaches; (2) neuralgic pain in extremities; (3) peculiar delirium; (4) profound toxemia; (5) cranial nerve palsies.

With the 1923 wave developing, entirely new clinical manifestations presented themselves. Lethargy, cranial nerve palsies and the Parkinsonian syndrome so frequent prior to this time were less common, but instead, two rather constant symptom groups were noted; in the one the myoclonic twitchings predominated; in the other, mental confusion with headache was characteristic. In the one the outstanding symptoms were: (1) history of acute nasopharyngeal infection with recovery; a week to ten days later (2) severe headaches, (3) neuralgic pains in the extremities, (4) myoclonic twitchings of the muscles of the face, extremities or trunk. In the other the predominating manifestations were: (1) headache; (2) insomnia; (3) mental symptoms especially at night (confusion; hallucinations; delirium); (4) bladder disturbances; (5) frequently no other evidence of organic nervous involvement or of pathologic reflex changes.

It is of interest to note that practically no change either in the localization or the character of the neuropathologic findings of the brain or cord was observed in these different symptom groups. The only exception noted was a more extensive involve-

ment in the region of the medulla in those cases associated with marked myoclonic twitchings.

In our series about 300 spinal fluid examinations were made. The outstanding feature was the disproportion between the marked clinical symptoms and the slight pathologic findings in the spinal fluid. Only one case gave a spinal fluid picture of marked intensity: the fluid was clear, under great and prolonged pressure, showed over one thousand lymphocytes, a marked globulin excess, a colloidal gold curve 0012234432, a web-like fibrin formation, a negative Wassermann; no bacteria in smear or by guinea-pig inoculation; no sugar estimate was done. In all the other fluids examined, the clinical manifestations were more pronounced than the spinal fluid findings indicated. The spinal fluid was normal throughout in 35 per cent of the cases. All spinal fluids except three were clear and colorless; one was bloody and two definitely xanthochromiac.

The case with the bloody spinal fluid was seen in consultation with Dr. A. Shimonek of St. Paul. A woman, aged 30, had a convulsion, developed headaches, diplopia, paresis and hyperesthesia of the right leg, a moderate degree of drowsiness and a temperature of 99-101 for one week, with a normal spinal fluid. Her systolic blood pressure was 140, diastolic 75. Within four weeks she had sufficiently improved to be up and around, when she suddenly became unconscious and died within 24 hours. A lumbar puncture at this time by Drs. A. Sweeney and G. N. Ruhberg gave a markedly bloody spinal fluid under pressure. No autopsy was permitted. Sclerotic changes with calcareous degeneration of the cerebral bloodvessels have been reported in chronic cases.* Although this has not been observed during the acute stage, the apoplectic onset and the bloody spinal fluid in this case were indicative of a cerebral hemorrhage occurring during the convalescent period.

One of the cases with the yellowish spinal fluid, seen in consultation with Dr. M. Larsen, St. Paul, was a male aged 45. His main symptoms were headache, photophobia, confusion and undue irritability, with a moderate degree of temperature. The spinal fluid was under pressure, markedly yellowish, and contained an excess of globulin, 12 cells, sugar 0.95. The spinal Wassermann and colloidal gold curve were negative. He made a satisfactory improvement in four months.

The other case, seen in consultation with Dr. F. A. Rieckhoff of Defiance, Ohio, was a woman, aged 26, with symptoms of headache, diplopia, photophobia, rigid neck and Kernig sign, marked delirium and profound toxemia; temperature between 99 and 103 degrees. Death occurred in twelve days. The spinal fluid was under moderate pressure, definitely yellowish, contained a globulin excess, 40 lymphocytes, a negative Wassermann, a colloidal gold curve 0000011221, sugar 0.1025. An examination made five days previous gave similar findings except that the cell count was over 200.

In the 65 per cent of the cases where the spinal fluid gave pathologic findings, two syndromes predominated. In the one we found increased pressure, a moderate pleocytosis 12-250 (mostly lymphocytes), a globulin increase, a luetic colloidal gold curve, and increase in sugar. In the other syndrome, the spinal fluid was under increased pressure, gave a cell-globulin dissociation, some change in the colloidal gold curve and sugar excess. An increase in pressure and a moderate excess of globulin were the two most frequent findings.

This brief study of some of the phases of epidemic encephalitis in Minnesota makes one apprehensive as to what the coming year may bring forth. Let us hope that the disease has reached its height. However, epidemics, as a rule, do not suddenly disappear, and in all probability many more cases with confusing and complex syndromes will make their appearance for some years to come.

*Buzzard and Greenfield: *Brain*, 1919, p. 330.

THE RECTUM AS A FACTOR IN CHRONIC FOCAL INFECTION*

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In recent years with the development of the roentgen ray and other laboratory methods the importance of focal infection has been very forcibly brought home to the medical profession. Its importance is admitted and the present problem is to discover every site in the body which may harbor such infection. Naturally those most accessible and easily examined were the first to be studied and reported upon. The teeth, the tonsils, the sinuses, gallbladder, appendix, prostate, the pelvic and other organs have all come in for their share of investigation. The result is that many affections which in the past would have had serious or fatal issue have been relieved or cured by eradication of exciting foci.

As a proctologist I wish to call attention to the rectum as a focus of infection and one which in the past has been frequently, I almost said usually, overlooked. I do not mean to say that every person with a systemic disturbance has a focus hidden in the rectum, but I do mean that in cases where a focal infection is suspected as the probable cause of the malady, in justice to the patient he cannot be dismissed until the rectum has been carefully examined as well as the other portions of the body which may harbor the exciting infection. The result of infection in the rectum upon the organism as a whole is the same as when located elsewhere in the body. These effects need not be discussed as they are well known and the literature is replete with articles on the subject of focal infection. It is the purpose of this paper to deal chiefly with the diagnosis of these infections in the rectum. With a little care and patience they are easily found.

The common types of infection either alone or in combination located in the rectum are as follows:

1. A general proctitis usually associated with colitis.
2. Infected hemorrhoids.
3. Ulceration of the rectum.

4. Cryptitis.

5. Sinuses leading off from the rectum.

In the cases of proctitis and colitis the diagnosis is usually very easily made by simple inspection through the proctoscope. For this reason further remarks are unnecessary other than to bear in mind that these conditions may be the cause of trouble elsewhere in the body and should not be neglected.

Infected hemorrhoids are usually not overlooked as they bleed and appear eroded. However, in some cases where they are large the site of infection may be hidden by the bulging of the hemorrhoid itself and the tumor must be pushed to one side before the ulceration is seen.

In cases of ulcer also there is usually little difficulty in diagnosis, a cursory inspection through the proctoscope being sufficient. However, occasionally there may be an ulcer of considerable size lying back of one of Huston's valves which may quite easily be overlooked. For this reason in examining one should be sure that *all* of the rectal wall has been inspected. While ordinarily we feel that an ulcer or wound which has free drainage does not cause much systemic disturbance, still this is not always the case as the following case will illustrate:

A male, thirty-eight years old, a mechanic by trade, complained that for about two weeks he had had some rectal discomfort and the passage of bloody mucus with the bowel movement. The past three or four days he had had pain in the right shoulder on motion and there was a slight swelling. When the proctoscope was passed nothing was seen except a little blood-tinged muco-purulent material clinging to the rectal wall. However, on more careful inspection a good sized ulceration was found on the upper side of the second valve of Huston. Under direct medication this ulcer quickly subsided and the pain in the shoulder also disappeared.

In case of cryptitis there is usually little constitutional effect although this condition is the most frequent cause of the sinuses which lead off from the rectum and which I will discuss later. The diagnosis of this condition is best made with a bivalve speculum. When opened this puts the lower part of the rectum on a stretch and thus spreads open the crypts, thoroughly exposing them for inspection. In connection with this it is well to remember that, while the crypt may appear healthy, at the lower end of the crypt is a blind pocket which may extend downwards underneath the anal mucous membrane as far as three-eighths of an inch. This acts as an admirable incubator for bacteria and is the most vulnerable site for the

*Presented before the annual session of the Minnesota State Medical Association, St. Paul, October, 1923.

development of infection. It also acts as a reservoir for products of infection from the crypts above and it is from this pocket, rather than from the upper part of the crypt, that the abscesses usually develop. It is therefore important that, even though the upper portion of the crypt appears normal, careful examination of its terminal portion be made.

It is the fifth or last type, namely, the sinus, which is the most often overlooked and to which I wish to call especial attention. Occasionally the openings of these sinuses are upon the wall of the rectum, above the area occupied by the crypts of Morgagni; but this is rare. Careful inspection of the rectal wall with the rectum distended with air and then exploring any suspicious areas with a probe will easily reveal them. In a great majority of cases, however, the sinus has an opening in the base of a crypt of Morgagni or more accurately speaking in the pocket at the lower end of the crypt of Morgagni. In this way the opening is well concealed and it must be carefully sought out. The sinus may extend directly into the tissues at right angles to the ano-rectal junction but in my experience this is rather rare. The more frequent type is that which extends outwards and downwards from the ano-rectal junction towards the external surface. Less often they extend upwards under the mucous membrane of the rectum. Another type described by Terrell, Landsmann and others is a sinus which extends downwards from these pockets just beneath the skin. These usually give no constitutional symptoms but are the cause of some of the cases of pruritis ani.

Regardless of the type of these sinuses their history of origin is the same, that is, they are always the result of an abscess formation. Aside from a few very rare injuries to the rectal wall by foreign bodies the general cause is about as follows: Due to some irritation, chemical or mechanical or infectious, the mucous membrane lining the crypts of Morgagni become inflamed, the pocket at the lower end acting as a reservoir, and this infection becomes chronic. Eventually due to sudden trauma of a large stool or diarrhea or the action of the infection itself this mucous membrane becomes broken and allows the infection to spread into the submucous tissues. If the infection is of sufficient virulence a frank abscess, which points externally and is readily recognized as the usual peri-rectal or ischio-rectal abscess, results. However, in many

cases this does not occur. The abscess forms rather slowly, surrounding itself with a firm thick wall of induration. The patient experiences some discomfort but there is frequently no visible external manifestations. If a bi-manual examination of the peri-anal and rectal structure be made at this time a distinct induration can be felt in the tissues. Pressure causes more or less pain. Before this spreads enough to give external signs the already diseased and weakened wall in the crypt gives way and the abscess is evacuated into the bowel. The pus is passed with the next stool and is usually unnoticed. The soreness which is present subsides and all noticeable symptoms disappear until the cycle repeats itself. Infrequently there is some tenderness in the glands of the groin, which may call attention to the fact that some infective process is present. The danger of these sinuses is that of any pus cavity where there is insufficient drainage.

The most simple method whereby these sinuses may be discovered during the period of quiescence is by dilating the lower end of the rectum, exposing the crypts of Morgagni and then exploring them with the tips of bent probes of various sizes. If sinuses are present the tip of the probe can be slipped into them although upon inspection they cannot be noted. During the intervals while the cavity is draining constitutional symptoms are usually too slight to be noticed by the patient. However, as soon as drainage is retarded the soreness returns, greater absorption occurs and there will frequently be a flare up of infection elsewhere as is always the case when an active focus of infection is present in the body.

While I have had a considerable series of these cases I will cite but two, which I think are typical of the effects of this condition. These cases were both seen during an acute exacerbation of their chronic trouble.

The first patient was a male who had had recurrent attacks of bronchitis. These attacks were very severe, usually confining the patient to bed for two or three weeks. They occurred in summer as well as winter and usually without any cause that could be determined. The attack which occurred previous to the one where I had the opportunity of seeing him had necessitated a three months' trip to the north woods to regain his health. He was underweight and his general appearance was that which is usually associated with a predisposition toward chest affections. During the bronchial attack in question he complained of some slight rectal discomfort and I had the opportunity of seeing him. By inserting the index finger into the rectum and palpating this area between the thumb and forefinger

a slight thickening could be palpated posteriorly but no definite mass could be felt. This area was slightly tender. Upon examination as indicated the tip of a probe could be easily slipped into a sinus opening into a crypt of Morgagni. This condition was operated and the patient has been well since and there has been no recurrence of the bronchial attacks. Upon questioning, the patient recalled that his previous bronchial attacks had been accompanied by slight rectal discomfort, but the bronchial symptoms had been so severe the slight rectal symptoms had been disregarded.

The second case was that of a man who had had recurrent attacks of lumbago for fourteen years. These would occur two or three times a year and last from two to six weeks, necessitating his remaining in bed. During these attacks he always had a feeling of fullness, heaviness and discomfort in the rectum and although repeated rectal examinations had been made nothing had ever been discovered. At the time I saw him he had just had an attack of lumbago. An induration the size of the kernel of an almond would be felt by bimanual examination and a sinus opening into a crypt demonstrated with a probe. There was no pus at the time of examination. The sinus, which had a very thick fibrous tissue wall, was dissected out and the man has been well since (over four years).

I have endeavored to be conservative in the presentation of this paper, for with the recent wholesale extraction of teeth it would seem that some conservatism in dealing with focal infection is necessary. I would not have the rectum enjoy the recent popularity of the teeth, but neither should it be entirely forgotten. We know that there are a definite number of patients having disturbances due to focal infection located in the rectum. This being true, in no case where focal infection is suspected or where the diagnosis is obscure has full justice been done the patient until a careful rectal examination has been made.

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DISCUSSION

DR. L. A. BUIE, Rochester: I am very glad that Dr. Fansler has presented this paper on the subject of the rectum because it is so seldom that we ever hear one or read of it in a journal. Especially am I glad because he has presented the proctoscopic phase of the subject. A few minutes ago Dr. Corbett drew a tragic picture of a man with a spinal cord tumor—a man in a terrible state—and he claimed as one reason, the fact that this man had been unable to get a diagnosis because the diagnosis was difficult. I need not, I am sure, draw the familiar picture of a man coming in the last stages of carcinoma of the rectum—the emaciation, the symptoms of obstruction, and so forth. The condition of this man is not due to the fact that the examination or the diagnosis is difficult.

Thoroughness is the keynote to all diagnostic endeavor. The best internists are those who employ exhaustive methods of diagnosis. However, the attitude of even these men toward patients who present rectal complaints is astonishing. Few of us possess more of an equipment for rectal diagnosis than the index finger, and most of us who own proctoscopes have forgotten where they are stored.

Tragedy stalks into our hospitals and clinics every day; and our patient tells us that Doctor "So-and-So" has been treating him for bleeding piles. A diagnosis of cancer of the rectum is very frequently made at the time of hemorrhoidectomy in spite of the fact that it could much more easily have been done with a proctoscope. One of the chief reasons why this condition exists is the inefficiency of the teaching of proctology in undergraduate schools.

Dr. Fansler has presented a subject which will prove its worth. The conditions to which he refers cannot be diagnosed with the index finger. Proctoscopy is necessary. You must familiarize yourself with normal structures in the rectum and the anus, as well as these structures in disease, in order to be able to discover the things of which he has told you. Cryptitis and papillitis are just as much a disease entity as tonsillitis; and involvement of these structures causes the same amount of disturbance locally and systemically as foci. The removal of these conditions will produce cure in the same manner as tonsillectomy or any other surgical treatment of surgical conditions.

other surgical treatment of surgical conditions. There are few physicians who have not treated hemorrhoids with a cancer only three inches away. Let's be careful lest our antipathy for the rectum of our patient cause us to murder him.

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EDITORIAL

WOOL GATHERING

Much newspaper notoriety is presently given to Lieutenant Wood, a young army officer stationed in the Philippine Islands. Rumor has it that he has profited heavily in stock manipulation. So important is this that even a congressional committee investigation is promised. Everybody is interested, and a possible epidemic of speculation of like manner is imminent. Before this epidemic gets under way, every physician, particularly, should be inoculated against it.

An old saying relates, "He who goes out to gather wool often returns himself well shorn." Doctors have long been the prize dupes in dissipating their earnings: most of them come into their numerous years of training without any business experience whatever to bring out any financial foresight that might at least be latent and forthcoming. Most of

them as students have been desperately "hard up." The first money they earn appears like "manna from heaven": the skies are clear; youth is to remain perpetual; time is no factor. So, the first precious years are either lost in garnering useless rubbish of stocks of all descriptions, or in struggling with unnecessary, unwise and injudicious obligations, entailing financial outlays that sorely postpone and interfere with the professional advancement known to be so necessary but daily becoming more impossible.

What would be the result if, when the association meets in St. Cloud next year, the President should ask in general assembly all those who "had gone wool gathering" to stand up? You know precious few would remain in their seats, particularly if the question was understood. And furthermore, if those who brought back any appreciable "wool" were asked to remain standing, the chairman would need no other fingers than his own to count them.

Regardless of all that may be said concerning our varied obligations—moral, civic or professional—we may as well face the bald facts: only five out of every one hundred people attaining the age of sixty-five are independent for their support. It should be evident that the first duty of every man is to make a living; his next is to provide for a family; then, to so live by spending less than he earns, to save, for his own period of possible dependency and that of his family. Saving is rarely a matter of income; it is far oftener the ability to spend less. Hence, saving is rarely impossible. Speculation and saving have as much in common as yachting and potato digging. The yachtsman may say that "sometime" he will dig potatoes, but the "house of 'sometime' is on the road to never." The lesson is perfectly obvious, but if any more were needed let a worthy medley of medical "wool gatherers" get together and agree to this equally obvious financial dictum:

"When we buy stock in somebody else's business, we bet on their ability to succeed. If we are right they rarely fail to find means to keep the profits. If they fail they can truly say, 'You would have gladly accepted the profits were they forthcoming. In the face of losses you miss only your money—we have lost all our time. Anyway you seem to

get it easily and you are amazingly lucky; we are most unhappy!"

No method of saving has so far been devised that can compare with proper life insurance. It is the first safeguard of the thoughtful young physician. Thereafter, any speculation that is presented should be passed upon by a conservative banker. The latter are just as numerous as reliable doctors. Make friends with them and listen to their counsel. They accept our word about their life and health. If we would take their advice on finance, in a few years we would save enough money to pay the Soldiers' Bonus!

E. L. T.

THE FRIENDS OF MEDICAL PROGRESS

There is a certain type of human being who is anti everything. We do not mean the individual, who whenever a statement is made can be counted upon to take the opposite stand and argue accordingly, but the one who never concurs in the judgment of the majority of those who have given the matter consideration. They are rather proud of being different from the ordinary run of men, and not being content to keep their opinions to themselves take great delight in winning others to their point of view. We see the type in many lines of activity. In national politics they are outstanding.

Then there is another type of mind that will not or more accurately cannot think for itself and blindly follows whoever takes the lead.

Both of these types make up the ranks of the anti-vaccinationists and anti-vivisectionists. The leaders of these organizations seem to be unable to reason logically, and misrepresentation has gained large numbers of recruits. Their strength is attested by the fact that within the last few years they have been able on three occasions (twice in California and once in Colorado) to submit for public vote an anti-vivisection bill so drastic that, if adopted, it would have closed every research laboratory and prevented the manufacture of vaccines and serums in the state. The health authorities, physicians and veterinarians would, it is true, have been simply inconvenienced in their fight against diseases such as smallpox, diphtheria, meningitis, typhoid and hog cholera by having to import fresh biological products from other states. It is anything but pleasant to contemplate the situation if such laws were to be enacted in every state in the

Union. And this is the actual danger if this element gets a foothold in one or two states.

On the cover of a widely circulated magazine, the official organ of an anti-vivisection organization in New York, appears the following:

"I invite all Anti-Vaccinationists, Anti-Vivisectionists, Eclectics, Homeopaths, Chiropraths, Osteopaths, Naturopaths of all branches, Christian Scientists, New Thoughtists, Theosophists, Medical Freedomists, and all brave and honest physicians of the Allopathic School (who secretly denounce the machinations and conduct of the political doctors) to send in their names and enroll as active participants in an Association of Free People against Medical Tyranny."

Let us hope that all this outlay of irregulars and "all brave and honest physicians" will not join the ranks.

To show how some of these organizations will deliberately falsify to gain their point, not long ago the Vivisection Investigation League, so-called, sent to a thousand newspapers the statement that Dr. W. J. Mayo demanded the protection of dogs from the vivisection table. Dr. Mayo, when questioned, made the statement, "The trouble with the anti-vivisectionists is that they are not only dishonest but willfully dishonest. The truth is not in these people."

In 1914 Mr. Rockefeller gave a million dollars to establish in New Jersey a laboratory for the study of animal diseases. The anti-vivisectionists persuaded the governor to veto a bill authorizing the work.

For years physicians could not get a whole-hearted laugh out of "Life." "Life" has found the anti-vivisectionists out and will have nothing more to do with them. Ernest Thompson Seton, the last scientific man in their ranks, resigned two years ago and told them why he did so.

Realizing the danger to the country of this anti-medical faction, a group of non-medical citizens organized in 1923 The Society of Friends of Medical Progress, whose avowed purpose is to aid all research and humane experimentation for the advancement of medical science, to inform the public of the truth concerning the value of scientific medicine to humanity and to animals, and to resist ignorant or fanatical persons or societies urging dangerous legislation. The name of Dr. Charles W.

Eliot, President Emeritus of Harvard, appears as honorary president. The honorary vice presidents include President Angell, of Yale, and the Honorable Charles Evans Hughes. The secretary is Mr. Edward Wigglesmith, Director of the Boston Museum of National History and headquarters are at 28 Newbury Street, Boston.

It is truly refreshing to hear of a move of this sort and we venture to predict that the society will have a large membership from the medical profession.*

*A check for one dollar payable to "Friends of Medical Progress, Inc." and sent to headquarters at 28 Newbury Street, Boston, will entitle the sender to associate membership.

MISCELLANEOUS

GAS BONDS—AND THE MISTAKE OF TRYING TO JUDGE AN INDUSTRY AND ITS SECURITIES BY A CASUAL GLANCE AT SURFACE INDICATIONS

By SAMUEL O. RICE

Educational Director, Investment Bankers Association of America

Time was when somebody made money by manufacturing bootjacks. Today there is no market for bootjacks and only a few, if any, are made. A bootjack factory would be an extremely poor basis for an investment. Bootjack making is virtually an obsolete industry.

Many persons have an erroneous notion that the industry of making manufactured gas is somewhat tending to decreased production because of electricity. They conclude that because electric lighting has caused a great decrease in the use of gas for lighting homes and streets that the market for gas has been reduced. That notion comes as near being an absolute error as any notion could be. In the last 10 years production of manufactured gas in the United States has increased 100 per cent. In the same period consumption of gas for industrial purposes increased 1,000 per cent in the United States.

The manufactured gas business was scarcely ever more prosperous than now. The reason is because of the increased use of gas in industry. Modern heating processes in manufacturing use great quantities of gas, for gas has been found to be the most economical and efficient in heat treating processes of manufacturing.

Of course, the casual observer may not be blamed for erroneously concluding that electric lighting has cut in on the gas business. It looks that way on the surface perhaps, but that simply shows how dangerous are surface indications. The fact is that electricity really did the gas industry a service when it took the little home-lighting load off the gas companies and enabled the gas companies to use their capital and energies for developing the larger industrial

field. Electricity is cheap for power, but expensive for heating purposes. Gas is cheap for heating purposes.

Gas also has the advantage of diversified use. In periods of depression people do not stop using gas stoves. In the future development in the use of gas, men of long experience in public utilities confidently predict that gas will be increasingly used for heating in cities. Transportation of gas is much cheaper than transportation of coal. Not only are rail and water transportation of coal expensive, but local hauling of coal is becoming an expensive proposition in many cities. The indications all point to an increased use of gas for heating homes and business buildings in the large cities.

The foregoing is, of course, openly conjectural. It is, however, sound. The future of the gas business seems assured. Certainly its present situation is gratifying. I am led to write this because I have heard a number of surface-indication logicians object to gas bonds because electricity had almost usurped gas lighting in homes. One such person even advised a widow to sell certain fine gas company bonds her husband had left her. It was abominable advice, based on ignorance. The bonds in question were safe, high-yielding, very desirable.

Perhaps I may be a bit tiresome in repeatedly pointing out that an investor should go to some honest, dependable authority to learn the true worth of any investment he is considering. What sort of an investigation can any man make of an enterprise in which he contemplates investing? He can, if he has time, visit the factory, the electric plant, the gas plant or other enterprise whose bonds he is considering. He can look at them carefully, go over the books, and then what does he know? How can he possibly be competent to judge whether it is a good efficient plant, whether its different units are all right, whether as a whole it can produce and meet competition sufficiently well to pay interest or dividends? How can he know that the "corporate structure" is right? By that I mean how can he determine accurately that it has been financed most efficiently, that the right proportion of common stock, or of preferred stock, and of bonds has been judged? No man unless he is an investment banker can do that and usually investment bankers have engineers, accountants, attorneys and all sorts of specialists to help them do it.

In these articles I have determinedly endeavored not to try to persuade any one to buy any particular issue of any investment security. Instead, I have tried to show how complex a business is the making of sound investment securities. In my own little investments I never buy anything without talking it over with one or more investment bankers. I suppose I am in as good a position as any one could be to garner "inside tips," but strange as it may seem I have found the much-talked-of "inside tip" virtually non-existent. I have found, however, a world of sound, dependable information, frankly and openly given. As a result, if I may be pardoned a further personal allusion, I have never lost a penny in investments, either my own small funds or money of two estates I have administered. It all depends on the investment dealer you select. I know several hundred honest and competent ones—surely any physician is good enough judge of character to select one and not put his money into schemes of crooked or incompetent promoters.

OBITUARY

DR. JAMES A. QUINN

Dr. James A. Quinn died at St. Paul, December 27, 1923. Dr. Quinn was born near Springfield, Ill., December 8, 1855, and, with his parents, William B. Quinn and Louisa Tomilin Quinn, settled the same year upon a farm at the present site of Merriam Park in St. Paul, where he lived until he was eleven years of age. The present Quinn Farm, now bounded by Snelling, Larpenetour and Hamline Avenues, near the State Fair Grounds, has been his home since 1866.

Dr. Quinn, as a boy, attended the public district schools, and at an early age was sent to a Methodist Seminary in Illinois, in preparation for the ministry. Upon returning to Minnesota, he attended the State University, finishing there in 1876. He graduated in medicine at Columbia, in New York, in 1880, and, soon after completing his internship in New York hospitals, became associated with Dr. J. H. Murphy, one of the pioneer surgeons of St. Paul. He was coroner of Ramsey county four terms of two years each, the last two terms being indorsed by all political parties. Dr. Quinn was president of the Ramsey County Medical Society in 1898. He was chief surgeon of the Great Northern Railway from 1892 to the time of his retirement from practice, two years ago, on account of ill health.

In the passing of Dr. Quinn, one of St. Paul's most widely known, popular and picturesque characters in the profession is gone from us. As a farmer boy, with rod and gun, roving the present sites of St. Anthony Hill and the Midway district, from Fort Snelling to St. Anthony (now Minneapolis), and, later, as a young practicing physician he was known by every old-timer in this section, and his genial, cordial and companionable disposition rolled up probably the largest acquaintance ever enjoyed by any physician in St. Paul; among the profession of the state, too, and the entire Northwest, in years gone by, no society or association meeting seemed complete without him.

The "call of the wild" was strong within him and his hunting season, each year, meant from the first day of chicken season to the last day of the big game season. Up to the advent of the automobile, Dr. Quinn was a most familiar picture on the streets, driving his buckskin mare, "Topsy," who was as well known as he. In his capacity as surgeon for many railroads running in and out of St. Paul, his acquaintanceship reached far and wide and every village along two, at least, transcontinental lines in Minnesota, the Dakotas and Montana held one or more persons who knew him.

Careless and indifferent as to the obligations of others to him, he was most punctual and exact in his sense of obligation to others; and his devotion to his professional brethren never lagged. No road was too long nor weather too bad to keep him from the assistance of the young man in the profession who called for his help and his cheery, optimistic and encouraging words will be remembered long and well.

DR. D. EDMUND SMITH

Dr. D. Edmund Smith was born at Winona, Minnesota, December 20, 1867, the only son of Charles Henry Smith, of Potsdam, New York, and Clarissa Maria Moody (Smith), of Canton, New York. There were two sisters, Ruth Smith (See) and Mary Moody (Curran).

His father was a manufacturer, who moved from New York to Minnesota, and from Minnesota to Illinois, where Dr. Smith obtained his early training. He completed the high school in Chicago and then attended Amherst College, graduating with a B.A. He took his medical degree in 1894 at Rush, going to Johns Hopkins for post-graduate work about 10 years later.

In 1894 he came to Minneapolis as an intern in the old Asbury Hospital and had remained here in active general practice until his death, Dec. 15, 1923. In 1896 he married Alice Clark Dyer, who died in 1919. One daughter, Esther, survives her parents.

He served at various times on the medical staff of General Hospital, St. Barnabas and Asbury; was an active member of Westminster Presbyterian Church; belonged to the Chi Psi (academic) and Nu Sigma Nu (medical) fraternities; the Six o'Clock Club, and the Alliance Francaise. He was a member of the American Medical Association and Hennepin County Medical Society. He taught for a time at the University of Minnesota Medical School, about 1898.

Early in 1918 Dr. Smith entered the service of the American Red Cross with a commission of captain. In April, 1918, he was sent to France and stationed at Lourdes in the Pyrenees near the Spanish border. Here he found an opportunity for unique and extremely humane service. Being the only American doctor in the area, he established an American Maternity Hospital of sixty beds in which he performed a great and worthy service. He also attended the refugee men, women and children of the five other hospitals of Lourdes, which had been taken over with all the hotels, by the French Red Cross. At times he was the only physician in charge of all these homeless and starved people, whose numbers ran to five or six thousand. Insufficient help, insufficient food, and lack of medical supplies made this service a terrible one.

Dr. Smith remained at this post until the end of the war and gave such unselfish and untiring attention to it as to permanently impair his own health. In recognition of his devotion to his duty during this period, he received from France the Order of the Reconnaissance Francaise, and from Belgium the Order of the Angel of Rheims.

The death of his wife and his own depleted physical condition after his arduous service overseas resulted in his death, from a complication of diseases, December 15, 1923. The society is proud to have numbered him in its membership.

GEORGE WILLIAM KIRMSE

Dr. George W. Kirmse was born February 26, 1883, at Dubuque, Iowa, the son of Cora Ritter Kirmse and William D. Kirmse.

His early life and education through high school was at Dubuque. He obtained his medical education at the University of Chicago and St. Louis University Medical School,

graduating from the latter in 1907. After ten years of general practice at Clayton, Mo.; at St. Louis, Mo.; Smith Center, Kansas; and Frazee, Minnesota, he took up the special line of eye, ear, nose and throat. His practice at Frazee, Minnesota, was as a partner of Dr. Edgar R. Barton, who became a member of the Hennepin County Society in 1919.

Dr. Kirmse prepared himself for special work by post-graduate courses of study at St. Louis University, New York Eye and Ear Infirmary, and Manhattan Eye, Ear, Nose and Throat Hospital. He came to Minneapolis and became associated with Dr. George A. Kohler, with whom he practiced until his death.

During the World War he volunteered in the United States Navy and was commissioned a lieutenant in the Medical Corps. He maintained this connection after the war and was a member of the Naval Reserve at the time of his death.

He belonged to the Episcopal Church, the Elks, the Automobile Club, the Y. M. C. A., and the Masonic Fraternity. His medical affiliations were the Hennepin County Medical Society, the Minnesota State and American Medical Associations.

Dr. Kirmse is survived by his wife, Aldine Jacobsmeyer (Kirmse) and their two sons; by his parents and two sisters—Lillian Kirmse Christy, of Dallas, Texas, and Cora Kirmse Preitaner, of Dubuque, Iowa.

Dr. Kirmse was a great lover of outdoor recreation and especially hunting. It was on a hunting expedition that he met his untimely death, being drowned in Lake Sylvia, near South Haven, Minnesota, November 25, 1923. The exact manner of his death is unknown. With a cousin he was last seen in a boat on the lake during a storm. Both bodies were recovered after much search, several days after their empty boat was washed ashore.

JOHN MICHAEL EGAN

Dr. John M. Egan was born at Osseo, Minnesota, January 5, 1883, the son of Mary Jane Ryan Egan and Edward Egan.

His father was a New York man who moved west to become a rancher. Dr. Egan obtained his early education at the village school and his high school degree at Anoka. He obtained his medical degree in 1907 at the University of Minnesota. There followed a year's internship at the Minneapolis City Hospital.

From 1908 to his death he practiced continuously in Minneapolis. In 1912 he formed a partnership with Dr. W. J. Byrnes, which relationship was permanent. Dr. Egan was a general practitioner on the staff of St. Mary's Hospital, and a very active and hard-working man.

He belonged to the Catholic Church and was a member of the Knights of Columbus, the Ancient Order of Hibernians, the Benevolent and Protective Order of Elks, the Phi Beta Pi Fraternity, the Automobile Club, and the Golden Valley Golf Club. He was a member of the Hennepin County Medical Society, the Minnesota State Medical Association and the American Medical Association.

He is survived by a wife and four children.

He died suddenly, at his home, from acute dilatation of the heart, on November 30, 1923.

DR. WARREN A. DENNIS

The Administrative Board of the Medical School of the University of Minnesota records with great regret the death of Dr. Warren Dennis, Associate Professor of Surgery.

Dr. Dennis died in the prime of life and in the full activity of his calling. Intellectually mature, with an orderly mind developed by constant study and broad experience, he had attained to a high place in the profession.

By those of us who knew him best, he will be remembered as much for his personal charm and his sterling worth as for his high professional attainments.

The story of his life is one of unassisted effort. Losing both father and mother at an early age, he was cared for by relatives, to whom, during all the succeeding years, he has made every remembrance. His years of study and graduation at the University of Wisconsin were achieved, in the main, through his own initiative. The work he did there is suggested by the fact that he stood high in Phi Beta Kappa. Two or three years of school teaching furnished sufficient support to permit him to enter the Medical School of the University of Minnesota in the fall of 1893, from whence he graduated in 1896.

With an intense desire for knowledge, trained in study, experienced in the expression of his thoughts, relatively older in judgment than his fellows, more fully appreciative of the curriculum, acknowledging the efforts of his teachers, stimulating them, by his earnest endeavor, his interest and his helpfulness in the affairs of others he immediately obtained and held a high position of esteem and respect not only among his classmates, but among the faculty and in the profession, with whom he came in contact in future years.

He interested himself in medical affairs and wherever he went he won recognition. He was a past president of the Ramsey County Society and of the Minnesota Academy of Medicine, a District Councilor of the Minnesota State Medical Society and Secretary of the Western Surgical Society.

He held commanding positions during the two recent wars; as major surgeon of the 15th Minnesota in the Spanish-American War, and as major surgeon and lieutenant colonel of the 88th Base Hospital, with which he served in France during the World War.

Never physically robust, his lack of resistance was well known to his friends and associates. His interest in his work led him many times to physical exhaustion. It was this tendency doubtless that determined the too early end of his career.

His relaxation was largely along lines of study, particularly in the languages, developing a ready command of German, French, Spanish and Italian. To the abilities that made him a splendid surgeon were added the judicial qualities of mind, which marked him as not only a wise adviser but a true counsellor and friend.

The Medical School offers to his widow and children its sympathy and the assurance of its appreciation of the rich legacy of love and appreciation he has left to them and to his friends.

DR. JOHN HUNTER ADAIR

Dr. John Hunter Adair, a practicing physician in Owatonna since 1884, died at his home Sunday morning, January 6, at the age of 65 years.

Dr. Adair was born on the Adair farm homestead in Havana, Steele County, July 26, 1858, the son of two of the county's first settlers, Robert and Flora Adair. His early education was received in the district school near Havana station and at Pillsbury Academy. From 1879 to 1880 he attended Carleton College, then going to Chicago to study medicine at Rush Medical College, from which he was graduated in 1883.

For one year following his graduation, Dr. Adair practiced medicine in Winnebago, after which he returned to his home city, Owatonna, where he practiced up to the time of his death. Dr. Adair had been an active member in his county and state medical societies, being president of the Minnesota State Medical Association in 1920. He was also an active member of the Southern Minnesota Medical Association, being a founder of the original society. In October, 1917, Dr. Adair was elected a fellow of the American College of Surgeons. In addition to his work as a general practitioner, he had been physician of the State Public School at Owatonna for 34 consecutive years.

Dr. Adair was active in civic affairs, being a prominent member of the Owatonna Rotary club. He was also a member of the Presbyterian church, the Knights of Pythias lodge, and the Ancient Order of United Workmen.

Dr. Adair's decline in health dated from the time of his wife's death in January, 1917. His great efforts in opposing the influenza epidemic in 1918-1919 were also contributory factors. His final illness, however, was of only a week's duration, resulting in a sudden demise, which was a shock to the community in which he lived as well as to all those who knew him.

He is survived by two daughters, Mrs. F. R. Kerman, of Berkeley, California, and Miss Catherine Adair, of Owatonna, and a sister, Miss Esther Adair, of Owatonna.

WILLIAM WHITFORD

William Whitford passed away December 10, 1923, twelve hours after his return from reporting the thirty-third annual meeting of the Western Surgical Association at Colorado Springs. At the time of his death he was the official stenographer for thirty medical societies throughout the United States. He had been the Official Stenographer of the American Medical Association and the Southern Surgical Association for thirty-four consecutive years.

He was born in Cornwall, England, in 1858. He was an honorary member of the Southern Surgical Association and Tennessee State Medical Association, a member of the Standardization Committee of the National Shorthand Reporters Association and at one time served as its President.

Mr. Whitford is well known to the medical profession of Minnesota, having been the official stenographer of the State Medical Association for several years.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

AMERICAN CONGRESS ON INTERNAL MEDICINE

The Eighth Annual Clinical Session of The American Congress on Internal Medicine will be held in the amphitheatres, wards and laboratories of the various institutions concerned with medical teachings, at St. Louis, Mo., beginning Monday, February 18, 1924.

Practitioners and laboratory workers interested in the progress of scientific, clinical and research medicine are invited to take advantage of the opportunities afforded by this session.

Address inquiries to the secretary-general, Dr. Frank Smithies, 1002 N. Dearborn St., Chicago, Ill.

CLAY-BECKER COUNTY MEDICAL SOCIETY

Dr. G. G. Haight, of Audubon, was elected president of the Clay-Becker Medical Society at the annual meeting of the society held in Moorhead December 27, 1923.

Dr. Martin Gergheim, of Hawley, was elected vice president; Dr. J. H. Heimark, of Moorhead, secretary and treasurer; Dr. W. H. Aborn, of Hawley, delegate to the Minnesota State Medical Association. The next meeting of the society will be held in March.

A dinner at the hotel was served preceding the meeting at which addresses were given by Dr. B. K. Kilbourne, of Fargo, who spoke on "Vital Statistics and Contagious Diseases," and Dr. L. J. Evans, connected with the Fargo Child Health Demonstration. A general discussion followed the meeting.

CENTRAL MINNESOTA MEDICAL ASSOCIATION

Dr. W. Robertson, of Litchfield, was elected president of the Central Minnesota Medical Association at the annual meeting held in Willmar December 27, 1923. Other officers elected for the coming year were: Vice president, Dr. L. W. Anderson, Atwater; secretary-treasurer, Dr. C. L. Scofield, Benson.

"Tonsillectomy Under Local Anesthetic," was the subject of a paper read by Dr. Will Robertson, Litchfield. Dr. E. H. Frost, Willmar, presented a paper on "Criticisms of the Medical Profession," which was followed by a talk on "Minnesota's Standing in Disease Prevention," given by Dr. C. L. Scofield, Benson. The president's address was delivered by Dr. John C. Jacobs, of Willmar.

FREEBORN COUNTY MEDICAL SOCIETY

Officers of the Freeborn County Medical Society for the coming year were elected at the annual meeting held in Albert Lea, December 17, 1923, as follows: President, Dr. J. P. von Berg, Albert Lea; vice president, Dr. W. L. Palmer, Albert Lea; treasurer, Dr. J. R. Nannestad, Albert Lea; secretary, Dr. F. G. Folken, Albert Lea. The following were elected to the Board of Censors: Dr. H. D. Burns, Albert Lea; Dr. J. R. Freeman, Glenville; Dr. C. R. Buttruff, Freeborn; and Dr. F. W. Calhoun, Albert Lea.

MAYO CLINIC LECTURES

Visiting physicians are invited to the Mayo Foundation lectures which are held Monday, Thursday and Friday evenings of each week during the winter and also to the staff meetings each Wednesday evening.

The program of lectures for February and March is as follows:

- Feb. 1—Cancer and Allied Subjects—Dr. A. C. Broders.
- Feb. 4—Uterine Prolapse—Dr. J. C. Masson.
- Feb. 7—Radium in the Treatment of Gynecological Cases—Dr. L. J. Stacy.
- Feb. 8—Dysmenorrhea—Dr. L. J. Stacy.
- Feb. 11—The Therapeutic Application of the Rays of Radium—Dr. H. H. Bowing.
- Feb. 14—Diseases of the Esophagus—Dr. P. P. Vinson.
- Feb. 15—Endoscopic Removal of Foreign Bodies from the Food and Air Passages—Dr. P. P. Vinson.
- Feb. 18—Significant Signs and Physiological Considerations in the Diagnosis of Empyema—Dr. W. S. Lemon.
- Feb. 21—End Results of Non-Tuberculous Inflammatory Disease in the Lung—Dr. W. S. Lemon.
- Feb. 22—Differential Diagnosis of Mediastinal Tumors—Dr. F. W. Gaarde.
- Feb. 25—A Review of the Present Status of the Treatment of Asthma—Dr. F. W. Gaarde.
- Feb. 28—The Treatment of Empyema—Dr. C. A. Hedblom.
- Feb. 29—The Treatment of Pulmonary Suppuration with Special Reference to Bronchiectasis—Dr. C. A. Hedblom.
- Mar. 3—The Treatment of Tumors Involving the Bony Chest Wall—Dr. C. A. Hedblom.
- Mar. 6—Nephritis—Dr. N. M. Keith.
- Mar. 7—Nephritis—Dr. N. M. Keith.
- Mar. 10—Diabetes—Dr. R. M. Wilder.
- Mar. 13—Diabetes—Dr. R. M. Wilder.
- Mar. 14—Vascular Diseases—Dr. G. E. Brown.
- Mar. 17—Diseases of the Joints—Dr. G. E. Brown.
- Mar. 20—Diseases of the Adrenals—Dr. L. G. Rowntree.
- Mar. 21—Diseases of the Pituitary—Dr. L. G. Rowntree.
- Mar. 24—Diseases of the Rectum and Anus—Dr. L. A. Buie.
- Mar. 27—Diseases of the Rectum and Anus—Dr. L. A. Buie.
- Mar. 28—Chronic Conditions of the Colon—Dr. A. H. Logan.
- Mar. 31—Diseases Due to Intestinal Parasites—Dr. L. W. Pollock.

WINONA COUNTY MEDICAL SOCIETY

The annual meeting of the Winona County Medical Society was held at the Winona General Hospital, January 8, 1924. Officers elected for the ensuing year included the following: President, Dr. Samuel Schaefer, Winona; vice president, Dr. W. W. Nauth, Winona; treasurer, Dr. F. T. Benoit, Winona; secretary, Dr. C. P. Robbins, Winona. Dr. W. F. C. Heise was elected to act as delegate to the next annual meeting of the State Medical Association with Dr. Irving W. Steiner as alternate.

The paper of the evening was given by Dr. S. W. Adler, who spoke on "Handling Contagious Diseases of Childhood." The next meeting of the society will be held in April.

THE MINNEAPOLIS SURGICAL SOCIETY

The regular monthly meeting of the Minneapolis Surgical Society will be held Thursday, February 7, 1924, at the University Hospital from 9 to 12 A. M. Operative clinics will be held by Dr. A. C. Strachauer, Dr. A. A. Law, Dr.

Johnson and Dr. Cameron, to be followed by a pathological conference with Dr. E. T. Bell and staff.

A dinner will be served at the University Hospital at 6:30 P. M. followed by the presentation of cases, and a paper by Dr. R. E. Farr on "Local Anesthesia of the Abdominal Sympathetic System."

NICOLLET-LE SUEUR COUNTY MEDICAL SOCIETY

The annual meeting of the Nicollet-Le Sueur County Medical Society was held at Le Sueur, December 13, 1923. Dr. F. W. Behmler, of Lafayette, was re-elected president of the society, and Dr. J. E. Le Clerc, of Le Sueur, was re-elected secretary.

The subject of the president's address was "The County Society." Other papers read included "The Blood in Health and Disease," by Dr. W. W. Covell, of St. Peter, and "Cancer," by Dr. F. A. Dodge, Le Sueur.

SCOTT-CARVER COUNTY MEDICAL SOCIETY

At the annual meeting of the Scott-Carver County Medical Society held at Jordan, December 6, 1923, the following officers were elected for the coming year: President, Dr. F. J. von Bohland, Belle Plaine; vice president, Dr. F. H. Buck, Shakopee; secretary-treasurer, Dr. H. W. Reiter, Shakopee. Dr. H. W. Reiter and Dr. John Landenberger, New Prague, were elected as delegate and alternate to the next annual meeting of the State Association.

STEELE COUNTY MEDICAL SOCIETY

Dr. Jerome F. Smersh, of Owatonna, was re-elected president of the Steele County Medical Society at the annual meeting held in Owatonna, December 11, 1923. Other officers elected were: Vice president, Dr. B. Melby, Blooming Prairie; secretary, Dr. A. B. Hart, Owatonna; treasurer, Dr. F. M. Smersh, Owatonna.

The annual dinner at the Hotel Owatonna opened the session followed by the election of officers. Dr. Charles S. McVicar, of Rochester, then delivered an address on "The Diagnosis of Dyspepsia," which was followed by a general discussion.

WATONWAN COUNTY MEDICAL SOCIETY

Dr. F. L. Bregel, of St. James, was elected president of the Watonwan County Medical Society at the annual meeting held in Madelia in December. Other officers elected are: Vice president, Dr. O. E. Hagen, Butterfield; secretary-treasurer, Dr. H. B. Grimes, Madelia. Dr. O. H. Ternstrom, of St. James, was elected to act as delegate to the annual meeting of the State Medical Association in October.

OF GENERAL INTEREST

Dr. and Mrs. Geo. E. Putney, of Paynesville, are spending the winter in Kansas City.

Dr. and Mrs. G. J. Ferreira, of Aurora, are the parents of a son, born December 24, 1923.

A son, Henry Walter, was born to Dr. and Mrs. J. deJ. Pemberton, Rochester, January 6.

A daughter was born to Dr. and Mrs. Harold T. Nesbit, of Rochester, Saturday, December 29.

Dr. B. V. Bates, formerly associated with Dr. C. F. Ewing, at Wheaton, is now located at Browns Valley.

Dr. William Crandall has disposed of his practice at Browns Valley and is now located at Graceville.

Charles Wesley, Jr., is the name of the son born to Dr. and Mrs. C. W. Barrier, Rochester, December 10, 1923.

Dr. A. J. Gibson, following a trip to Europe, Egypt, and South Africa, has returned to Duluth for the practice of medicine.

Dr. W. O. Ott, formerly assistant to Dr. A. W. Adson, Rochester, is now associated with the Harris Sanitarium, of Fort Worth, Texas.

Dr. L. M. Randall, formerly of Iowa City, Iowa, is now associated in the practice of medicine with Dr. R. D. Mussey, Rochester.

Dr. and Mrs. H. R. Hartman, of Rochester, have gone south for several months of travel through the Central American countries.

Dr. John Lyons, formerly of the Mayo Clinic, Rochester, is now located in Washington, D. C., where he will continue the practice of medicine.

Dr. O. J. Hagen, who recently completed a four months' course of study in eastern clinics and hospitals, has returned to his practice at Moorhead.

Dr. Harold N. Nagel, who recently completed his internship at the Minneapolis General Hospital, is now located at Waconia for the practice of his profession.

Dr. H. O. Altnow, of Mandan, N. D., is now in Cambridge, Mass., where he will enter the Harvard Medical College for a post-graduate course in children's diseases.

Dr. Chester Oppegaard, who recently completed his medical course at the University of Minnesota, is to be associated with his brother, Dr. M. O. Oppegaard, at Crookston.

Dr. K. V. Overend has resumed the practice of medicine at Hallock following a year's study in Germany and Austria, where he took advanced work in diseases of the ear, nose and throat.

Announcement has been received of the marriage of Dr. James B. Vail, of New York Mills, to Miss Verly Wheadon, of Balaton, which took place at the home of the bride's parents, January 1.

Dr. and Mrs. G. L. Jacquot, of Tyler, are spending the winter on the west coast, where Dr. Jacquot is pursuing a

special course of study in the medical department of Berkeley Institute near Los Angeles, Cal.

Dr. Bernard H. Simons, of Chaska, and Miss Adelaide Collins, of Minneapolis, were united in marriage in Minneapolis, December 27, 1923. Following a wedding trip in the East, Dr. and Mrs. Simons are now at home in Chaska.

Dr. W. W. Holley, formerly of Warren, is now located in Los Angeles, California. Dr. Holley will be succeeded as a member of the Warren Hospital staff by Dr. M. George Milan, formerly superintendent of the Oakland Park Sanatorium, Thief River Falls.

Dr. George D. Rice, of St. Cloud, a former major in the American army medical corps in France, was named medical officer in charge of the tenth district veterans' hospital being erected in St. Cloud, according to a telegram received by Dr. Rice from Washington, January 8.

Dr. A. G. Beyer, who after completing a post-graduate course in diseases of the eye, ear, nose and throat in Vienna, resumed his former practice at Red Wing, has accepted a position as member of the Dr. Wm. Mithoefer eye, ear, nose and throat clinic of Cincinnati, Ohio, where he is now located.

Dr. C. E. Anderson, who recently completed a year's work at the Swedish Hospital, Minneapolis, has taken over the practice of Dr. E. A. D. Jones, at Garretson, S. D. Dr. Jones plans to take a post-graduate course extending over a period of eighteen months in the eastern hospitals and colleges.

Dr. Bruce W. Jarvis, and family, of Minneapolis, sailed December 11, on the S. S. Korea Maru from San Francisco for Hong Kong, en route to China to become a member of the medical missionary staff of the North China Conference of the Methodist Episcopal church. He will be stationed at Taianfu in the Province of Shantung. Within a radius of fifty miles the territory around Taianfu has no missionary hospital or dispensary, and only one Chinese physician of western training. It is estimated that the medical center which Dr. Jarvis is to establish must serve a population of 4,500,000.

During the past year seven State Boards of Medical Examiners have perfected arrangements for the acceptance of the certificate of the National Board, in lieu of their own examination of candidates for licensure. The states are as follows: Illinois, Maine, Massachusetts, New York, South Carolina, Tennessee and Texas. The states accepting the National Board's certificate now total twenty eight and are as follows: Alabama, Arizona, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Iowa, Kentucky, Maine, Maryland, Massachusetts, Minnesota, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Vermont, Virginia and Washington.

A Convalescent Home for Women, located at 577 Oakland Avenue, St. Paul, Minn., has been opened by the Junior League of St. Paul to take care of patients recovering from any illness other than mental, contagious or infectious diseases. The home will accommodate fourteen women and is open to patients recommended by a doctor, who will

remain in attendance or be called when necessary. The home, when filled to capacity, will be only half self-supporting, the deficit of several thousand dollars each year to be guaranteed by the Junior League of St. Paul. The Junior League of St. Paul, Inc., is a branch of the National organization of Junior Leagues of America, Inc., formed to provide volunteers and financial support for social, economic, and philanthropic work. On the advisory board of the Convalescent Home are: Mrs. Joseph Stronge, Mrs. Wm. Mitchell, Mr. Charles Bunn, Dr. Jeannette McLaren, Dr. John L. Rothrock, Dr. John Rogers, Dr. Robert Earl, Dr. John Abbott, Dr. C. N. McCloud, Dr. Wm. C. Carroll and Dr. E. G. Sterner

Announcement has been received of the annual award of the Sofie A. Nordhoff-Jung Cancer Research prize, which was awarded for the first time in December, 1923, the recipient being Dr. Johannes Fibiger, professor ordinarius in pathological anatomy at the University of Copenhagen. Dr. Fibiger won the prize for his demonstration, following repeated experimentation, that parasites play an important role in the formation of certain types of tumors in the proventriculi of rats. Where others had failed after years of persistent researches, Dr. Fibiger first met with success in artificially inducing malignant tumors through external irritations and so threw wide new avenues to future findings. Fibiger and his associates have contributed generously to the literature of cancer production through the feeding to rats of oats and the application of tar to their issues. The award was made as a recognition of the most conspicuous work in the world literature bearing on cancer research, the commission on the award being composed of Professors Borst, Doederlein, v. Romberg and Sauerbach, all of the University of Munich.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

CUTTER LABORATORY:

Anti-Anthrax Serum for Human Use-Cutter.
Diphtheria Toxin-Antitoxin Mixture-Cutter.
Diphtheria Toxin for the Schick Test-Cutter.
Rabies Vaccine-Pasteur (Cutter).
Tetanus Antitoxin for Human Use (Concentrated)-Cutter.

E. R. SQUIBB & SONS:

Diphtheria Toxin-Antitoxin, 0.1 L+.

WINTHROP CHEMICAL COMPANY:

Elixir of Veronal.

NEW AND NON-OFFICIAL REMEDIES

National Radium Emanator.—A portable appliance for activating water with emanation; the emanation is emitted from a solution of radium chloride, barium chloride and sodium chloride. The appliance is claimed to produce 40 microcuries (150,000 Mache units) of radium emanation to 1,000 c.c. of water daily. The actions, uses and dosage of radium are discussed in New and Non-official Remedies,

1923, p. 255. National Radium Products Co., New York. (Jour. A. M. A., December 8, 1923, p. 1953.)

Iodostarine-Roche—Diiodotariric Acid.—An iodine addition product of tariric acid, derived from the fruit of a species of *Picramnia*. Iodostarine-Roche contains 47.5 per cent of iodine. It acts in the tissues similarly to inorganic iodides. It is not broken up in the stomach, but a portion of the iodine is split off when it enters the intestine. The undecomposed portion is readily absorbed and, as in the case of other fats, is largely deposited in the tissues where it is slowly split up. The action of iodostarine-Roche is exerted more slowly than that of the inorganic iodides. Iodostarine-Roche is supplied in the form of tablets iodostarine-Roche 0.25 gm., and as chocolate tablets iodostarine-Roche containing iodostarine-Roche equivalent to iodine 0.01 gm. Hoffmann-LaRoche Chemical Works, New York. (Jour. A. M. A., December 15, 1923, p. 2032.)

Tetanus Antitoxin for Human Use-Cutter.—Tetanus antitoxin, concentrated (see New and Non-official Remedies, 1923, p. 284), marketed in syringes containing 1,500 and 5,000 units each. Cutter Laboratory, Berkeley, Calif.

Diphtheria Toxin-Antitoxin Mixture-Cutter.—Diphtheria toxin antitoxin mixture (see New and Non-official Remedies, 1923, p. 284), each c.c. representing 3 L+ doses of diphtheria toxin neutralized with sufficient antitoxin to conform to the toxicity requirements of the U. S. Public Health Service. It is marketed in vials containing, respectively, 1 c.c. and 50 c.c., and in syringes containing one immunizing treatment. Cutter Laboratory, Berkeley, Calif.

Anti-Anthrax Serum for Human Use-Cutter.—An anti-anthrax serum (see New and Non-official Remedies, 1923, p. 287), marketed in double-ended vials containing 50 c.c. for intravenous injection. Cutter Laboratory, Berkeley, Calif.

Rabies Vaccine-Pasteur (Cutter).—An anti-rabic vaccine (see New and Non-official Remedies, 1923, p. 294), prepared according to the method of the Hygienic Laboratory of the U. S. Public Health Service. The emulsion from the cord is shipped daily and is diluted at the time of injection. The treatment consists of 21 daily injections. Cutter Laboratory, Berkeley, Calif.

Diphtheria Toxin for the Schick Test-Cutter.—A diphtheria immunity test (see New and Non-official Remedies, 1923, p. 323), marketed in packages of two vials, one containing diphtheria toxin and the other physiologic solution of sodium chloride for dilution. Cutter Laboratory, Berkeley, Calif.

Capsules Carbon Tetrachloride (Human Use)-P. D. & Co.—A brand of carbon tetrachloride-N. N. R. It is marketed in capsules containing 20 minims. Parke, Davis & Co., Detroit.

Elixir of Veronal.—Each fluid drachm contains veronal (see New and Non-official Remedies, 1923, p. 63), 2 grains in a menstruum containing alcohol 33.5 per cent. Winthrop Chemical Co., New York.

Diphtheria Toxin-Antitoxin Mixture (New Formula)-Squibb.—Diphtheria toxin-antitoxin mixture (see New and Non-official Remedies, 1923, p. 284), containing in each cubic centimeter 0.1 L+ dose of diphtheria toxin neutral-

ized with the required amount of diphtheria antitoxin. Marketed in packages of three vials, each containing 1 c.c.; and in vials containing, respectively, 10 c.c. and 20 c.c. of the mixture. E. R. Squibb and Sons, New York. (Jour. A. M. A., December 22, 1923, p. 2115.)

PROPAGANDA FOR REFORM

Liquid Petrolatum as a Laxative.—Liquid petrolatum is indigestible. It is not absorbed, and, therefore, cannot produce poisoning. In ordinary quantities the administration of liquid petrolatum does not seriously impair the alimentary efficiency. Like all laxatives used in very large quantities, liquid petrolatum may diminish the degree of utilization of food by promoting evacuation before the functions of digestion and absorption can be entirely completed. Liquid petrolatum may produce gastric distress and, therefore, should be taken in a way to interfere least with gastric digestion by administration before bedtime or an hour before meals. In reporting on a proprietary brand of liquid petrolatum widely exploited to the public, the Council on Pharmacy and Chemistry warned that constipation should be treated by dietary and hygienic means, as evacuants are but temporary measures. It further cautioned that liquid petrolatum is medicinal: it modifies greatly the intestinal flora; it acts as a lubricant and emollient; it modifies the absorptive powers of the intestinal mucous membrane; it is capable of influencing the digestion of fats; and, in short, liquid petrolatum is a drug, the indiscriminate and excessive use of which should not be encouraged. (Jour. A. M. A., December 1, 1923, p. 1896.)

Spahlinger Treatment for Tuberculosis.—Spahlinger is a resident of Geneva who received medical training but took his degree in law. Later he abandoned law for research work. The Spahlinger treatment makes use of vaccine and serum therapy. The theory from which the treatment is evolved is that the tubercle bacillus emits different toxins under varying conditions of temperature, environment, etc. Many of these are claimed to be isolated as either exotoxins or endotoxins. The vaccines—of which there are said to be about twenty—are used for prophylaxis for treatment of the milder cases of tuberculosis and for the production of the various serums used in the treatment of the more severe cases. It has been reported that the British ministry of health is prepared to encourage the experimental trial of the Spahlinger preparations under scientific supervision. The British Red Cross has appropriated money to enable Spahlinger to work on a larger scale in the production of his preparations. The reports in regard to the efficacy of the preparations which have appeared in British medical journals are conflicting, and the Red Cross organization has made it clear that the products are in the experimental stage. (Jour. A. M. A., December 1, 1923, p. 1896.)

The Galvano Method for Goiter.—In the cheap and not too particular rural weeklies, advertisements have appeared for the "Galvano Necklace," said to be "the latest discovery for the relief or cure of goiter by mild electrical treatment." The device is advertised by the Cosmas Pharmacal Co., Watertown, Wis. The advertising for this device stresses the fact that the U. S. Patent Office has granted a patent on it. The public does not know, of course, that the U. S. Patent Office has granted patents on many pieces

of medical pseudoscience. According to the patent specifications, the Galvano Necklace consists of beads made of glass, or other insulating material, between which are placed, alternately, small zinc and copper disks. Through the disks and beads run a metallic wire. The alleged purpose of the invention is that of "generating galvanic currents in contact with the skin in the presence of mercurous iodid and calcium chlorid." In use, an ointment containing mercurous iodid and calcium chlorid is applied to the skin of the neck, and the necklace is hung so that the zinc and copper disks will come in contact with the anointed skin. That this device has decided value in the treatment of goiter is unthinkable. Young women with physiologic enlargement of the thyroid will, doubtless, continue to purchase the device and as the enlargement disappears, as it normally does, will furnish testimonials for the promotion of the device. (Jour. A. M. A., December 8, 1923, p. 1974.)

Santoperonin.—According to Professor Heubner, the history of Santoperonin, claimed to be an ascaricide, does not arouse confidence. The proprietary was placed on the German market before satisfying the requirements that should govern the introduction of new medicaments. Its composition has varied; the exploiter has maintained an air of secrecy concerning the identity. Examination indicated that it was a mixture of copper oxid with organic material which consists essentially of aromatic compounds. There seems to be little clinical evidence to warrant its use. (Jour. A. M. A., December 15, 1923, p. 2055.)

"A" Formula or "The" Formula?—When the proprietary evil in the United States was at its worst, a common piece of advertising deceit was that of the fake formula. On its face, such a "formula" was impressive—at least to those who were not chemists. After the American Medical Association created its own chemical laboratory, the Association chemists demonstrated repeatedly the absurdity of the seriocomic chemistry of some of the pharmaceutical manufacturers. It was not long before the crude chemistry and cruder dishonesty of pharmaceutical concerns began to disappear. Yet today there are still a few firms which endeavor to lend plausibility to their wares by resurrecting old methods. The report of the Council on Pharmacy and Chemistry on Gly-So-Iodonate brings out that a formula, both qualitative and quantitative, appears on the label of the preparation. The formula is absurd and impossible, and the A. M. A. Chemical Laboratory found that some of the ingredients were not present in the amount claimed. (Jour. A. M. A., December 22, 1923, p. 2118.)

Does Heat Injure Vaccines?—It is generally believed that vaccines lose in potency on standing at room temperature. But, so far as known, the sterilization of vaccines by heat does not injure the antigenic potency any more than other methods of sterilization, e. g., chemicals. The astounding deduction of a manufacturer of vaccines that heat sterilization, at a definite temperature for a given time, must be highly injurious, because vaccines lose in potency on standing for weeks and months at variable room temperature, is simply a pseudoscientific statement intended presumably to bolster up the merits of the advertised wares in the eyes of the more or less thoughtless purchasers. (Jour. A. M. A., December 22, 1923, p. 2135.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

MEETING OF DECEMBER 12, 1923

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, December 12th, 1923, at 8 P. M. The President, Dr. A. S. Hamilton, called the meeting to order. There were 30 members and one visitor present.

Dr. J. T. Christison read the following memorial of the life of Dr. Warren A. Dennis, a former president of the Academy:

Dr. Warren Arthur Dennis was born in Walworth County, Wisconsin, December 5th, 1869. His death occurred in St. Paul, November 8th, 1923, after a protracted illness, from pneumonia. He is survived by his wife and six children.

He was a graduate of the University of Wisconsin in 1891, receiving the degree of B.L., later entered the medical school of the University of Minnesota, graduating in the class of 1896. After serving an internship of one year in the City and County Hospital in St. Paul, he became associated with the late Dr. C. A. Wheaton, one of the most highly respected surgeons of his day.

His professional life was devoted almost exclusively to the practice of surgery, in which branch of the profession he was regarded as a master. While excelling in his own specialty he always showed a keen interest in all branches of medical science. It was this outstanding quality that endeared him to his medical friends and associates, and helped in cementing friendships which were so enduring. His frank, sympathetic nature won him the everlasting esteem and reverence of his patients, to whom he was untiring in his efforts to serve.

Dr. Dennis enjoyed an enviable war record, having served in the Spanish-American war as a major. During the late war he attained the rank of Lieutenant-Colonel, serving with the 88th Overseas Division where he did notable work in brain surgery.

While leading a very busy life, Dr. Dennis was of a studious nature and was well versed in the latest problems of surgery. He was active in the many medical and surgical societies to which he belonged, and was prominent as an officer in most of them. An active attendant and frequent contributor to all of these organizations.

Our friend and confrere has departed, but we shall ever cherish the noble attributes of one so dearly loved and respected by a sorrowing family, a bereaved profession and a saddened public.

Signed: J. T. CHRISTISON
C. N. McCLOUD
FRANK E. BURCH.

The following candidates were elected to membership in the Academy: Dr. Wm. R. Murray (Minneapolis) and Dr. Carl B. Drake (St. Paul) were elected as active members,

and Dr. W. A. Coventry of Duluth, and Dr. M. S. Henderson of Rochester, were elected associate members.

There were no papers given at this meeting, but the following members reported cases:

1. DR. WM. LERCHE (St. Paul) showed lantern slides of several cases of suppuration in the posterior mediastinum that he had operated upon, and also cases of esophageal and tracheal fistulæ following mediastinal suppuration.

In connection with these cases, Dr. R. E. Scammon discussed the anatomy of the neck and mediastinum, and its embryological development.

2. DR. HENRY L. ULRICH (Minneapolis) reported a case of bilateral hydronephrosis and hydroureter of unknown origin. Gross specimen shown.

C. R., white, male, chauffeur, age 18. Was first admitted to the hospital on Oct. 14, discharged on Oct. 19th, readmitted on the 21st, and died on the 28th.

The family history was thought to be of some importance in that one of his brothers has talipes equinus and one sister has achondroplasia. The rest of the family was said to be normal. The patient had a number of the childhood diseases; was ill for 3 months at the age of 12 with typhoid fever and a so-called "blood poisoning" at the age of 13, at which time he was ill for 6 months. Although the patient stated that prior to the onset of the present illness he had been well, subsequent investigations showed that he had not been able to do his work in the usual manner for possibly 1 to 2 months previously. On Oct. 1st he was awakened from his sleep with diffuse cramps throughout the abdomen. This distress interfered with his sleep and continued, though less severe, up to the time of admission. On Oct. 2nd, he became nauseated and vomited, and this persisted during a period of 2 weeks. All his symptoms were less severe when in bed. A yellowish discoloration of the skin was noted at the beginning of the illness. In the interval between his discharge and second admission, it was said that he had been unconscious for a few minutes at one time. He was more thirsty than usual and had passed what he thought to be a greater quantity of urine than normal. Cramps in the legs occurring at night during the past 4 years was another symptom complained of.

On physical examination, the patient was found to be fairly well-developed and some under-nourished. Appeared much older than the age given. Mentality seemed below par. The skin and mucous membranes were pale. There was no cyanosis and there was thought to be some jaundice of the sclerae. There was no edema. The submaxillary and anterior cervical glands were palpable. The peripheral arteries were soft. The pulse was regular and of good quality. Blood pressure was 118/90. During observation, the highest systolic blood pressure was 126 and the highest diastolic was 90. The hand was large and angular in appearance. The hair was sparse; the pupils were equal, regular and reacted normally to light and accommodation. No nystagmus. Pyorrhea alveolaris present. There was a diffuse bilateral enlargement of the thyroid. The thorax was symmetrical. Harrison's grooves present; a slight impairment of tactile fremitus and diminished vesicular breathing noted over the left lower lobe posteriorly. No other physical findings made out in the examination of the lungs.

There was no bulging of the precordium and no visible cardiac impulse. A definite thrill or rub was noted on palpation over the precordium. The percussion dullness of the heart measured 2.5 cm. and 9 cm. to the right and left of the midline respectively. On auscultation, a harsh to-and-fro friction sound corresponding to the palpable thrill mentioned was heard during all phases of respiration.

There was no evidence of valvular disease. The vascular signs associated with adherent pericardium as well as the retractive phenomena were not observed. There were no abdominal masses. Abdominal muscles were tense at all times. The bladder was not found to be enlarged.

On admission, it was thought that an intention tremor, an ankle clonus, speech disturbance and Babinski (left) were present. None of these signs except his slow speech was apparent or found while on the ward. He was generally hyper-aesthetic and the tendon reflexes were hyperactive. Fundus examination was normal.

A number of urinalyses showed specific gravity 1010-1012; reaction, usually acid; albumen, heavy traces, 1 plus, —3 plus. Many pus cells and an occasional red cell. No casts were seen on any examination. There was no bile in the urine. On the days that the intake and output of fluid was measured, it was found that he was taking in about 700 c.c. and excreting about 400 c.c. of urine. No incontinence of urine. The phenolsulphonephthalein tests on several occasions showed no return of the dye..

The blood examination shows—hemoglobin 42 per cent, R.B.C. 2,440,000; W.B.C. 8,900; differential count and morphology normal. Later the hemoglobin was 37 per cent, 2,060,000 erythrocytes and 9,300 leucocytes. The Wassermann reaction was negative. The blood creatinin was 8.3 mgs. per 100 c.c. The urea nitrogen 221 mgs.; the blood sugar 17 per cent. Later the creatinin was 8.8 mgs., the urea nitrogen 244 mgs., uric acid 9.6 mgs. Alkali reserve 20.

The x-ray of the heart was taken at a distance of 6 feet and reported as cardiac hypertrophy and dilatation. The outline suggested a hypertension type. The sella turcica was reported as very small and plates of the kidneys were reported as normal in size, shape and position. The temperature varied between 96 and 99. The pulse usually about 90 and the respiration not more than 24.

The patient's breathing became labored. At times an uremic odor was noted on the breath. He became more and more drowsy, delirious, and finally comatose. He had frequent nose bleeds and vomited. Apparently his hearing was impaired. Toward the last a cardiac irregularity was noted, with increased rate up to 128. A cystoscopic examination was requested but not made.

The patient died October 28th. The clinical diagnosis was:

1. Acute fibrinous pericarditis
2. Renal insufficiency.

The post-mortem revealed a double hydronephrosis, double hydroureters. The ureters were enormously enlarged and there was very little kidney tissue left, only one pole of the right kidney. The bladder was slightly dilated. It looked like a paralytic bladder. There was absolutely no obstruction anywhere in the urethra to account for this dilatation.

Comment: This boy was evidently suffering from congenital hydronephrosis, and the remarkable thing about this case is that he should have lived to be 19 years old. I am only acquainted with one similar case of which the explanation was that the condition was due to multiple sclerosis. At least, this disease was associated with similar findings. This boy's spinal cord was negative as far as sclerosis was concerned, so we will have to attribute this boy's condition to a congenital lesion.

DISCUSSION

DR. OWRE: I saw this case at post-mortem, and there was absolutely nothing to account for the hydronephrosis. I cannot account for it unless it was congenital, and yet pathologists tell us there is no such thing. I had one case several years ago, of a boy 14 years of age, in which I took out the kidney and ureter, and the ureter was greatly enlarged.

DR. FARR: Last year Dr. Brown, of Detroit, Mich., reported about 100 autopsies on children or embryos that he had collected, with 66 per cent malformations of the genito-urinary tract. He described every deformity of the kidney and ureter that I have ever seen, or heard of, or read about.

DR. A. E. BENJAMIN (Minneapolis) reported three cases of diseased thyroid in one family. Mother and two daughters. Two toxic thyroids, one colloid with toxic symptoms.

CASE 1. Mrs. E., age 50, housewife, weight 150. Generally well.

Complaint: Enlarged and troublesome thyroid for about 20 years. Quite nervous.

Complete history record not found.

Examination: Thyroid enlarged. Right lobe the size of an orange; left half as large.

Diagnosis (preoperative): Cystic goitre.

Treatment: Operation 9-4-1913. St. B. Incision—collar. Sterno-thyroid and sterno-hyoid muscles clamped transversely and severed. Superior and inferior blood vessels of lobes clamped with forceps. Diseased interior portion of lobes removed, leaving most of the capsules. Blood supply ligated with chromic catgut. Capsule and remaining portions stitched with plain catgut. Muscles and fascia were stitched with chromic catgut. Small rubber drain inserted.

Specimen: Portion removed contained colloid material. Some cysts. Degenerating and hemorrhagic areas.

Results: Pulse rapid for a time but recovery was complete and patient has been well ever since operation.

CASE 2. Mrs. L. (daughter of case 1), age 24, housewife, married one year, no children, weight 100.

Complaint and Symptoms: Perspires considerably. Extremely nervous and trembly and rapid pulse, especially upon exertion. Nauseated and vomited, and bowels loose. Appetite irregular. Loss of flesh and symptoms progressed. Pulse 120-160. Was kept in a country hospital until symptoms subsided and was then removed to Minneapolis, where special diet, sedatives and general good care were given.

History: Family history negative except that mother was operated on for colloid cystic goitre in 1913. Personal history—usual children's diseases. Scarlet fever at 7 years. Influenza in 1920. Menstrual history—onset at 15 years; painful and scanty; missed last two months.

Examination: Head—enlarged turbinate, protrusion of eyeballs and uncertain vision. Tonsils irregular, not diseased. Right thyroid enlarged twice normal size. Thorax normal except rapid heart. Abdomen practically normal. Pelvis: slight retrocession of uterus, some enlargement of left ovary and prolapsed. Extremities: unsteady and trembling hands. Urine negative, hemoglobin 70 per cent, blood pressure 138/70, temperature 98.6-100.6. X-ray treatment for enlarged thyroid with little improvement.

Diagnosis: (Preoperative) Exophthalmic toxic goitre.

Operation: 1. Sept. 21, 1920. Anesthetic, local. Pulse 160. Upper pole of right thyroid ligated. Patient was very nervous and excited during the procedure, which symptoms continued for several days. Sept. 24, 1920, pulse 118, condition good.

2. Oct. 12, 1920. Local anesthetic and some gas. Blood vessels of both lobes ligated and the right lobe resected. Patient was very nervous at the time of operation and vomited considerably following it. Her condition gradually improved and she left the hospital Oct. 23, 1920. Condition good, and pulse 130-140.

3. May 21, 1921. Anesthetic—gas and novocaine were used. Pulse between 160 and 128 during operation. A complete removal of all diseased tissue on the right side was done. There were many adhesions present from former operations. Plain catgut passed back and forth through the capsule to control hemorrhage. Pulse when she left hospital 100. In good condition.

Section from thyroid: Many large dilated acini, containing colloid. The epithelium lining the acini is low cuboidal type. There are also a number of solid masses of cells in which the epithelium appears more cylindrical and active.

Diagnosis: Mixed goitre, colloid and toxic adenoma.

Results: Patient made a gradual recovery. Gained in weight and has been in good health since, excepting a little nervous, caused from disturbance of an abscessed tooth.

Oct., 1923: Blood pressure 138/100. Pulse 130. Weight 125. Hemoglobin 85 per cent.

CASE 3. Miss E. (daughter of Case 1), age 22, household duties, weight 115. Noticed neck was swollen and painful to pressure. Very nervous.

History: Family history negative except mother—colloid cystic goitre; sister—mixed colloid and toxic adenoma.

Patient has been quite well. Frequent frontal headaches, eyes rather weak but never examined. Sore throat frequently; tonsillitis once. Heart quite rapid the last few weeks. Appetite good, digestion good, bowels regular. Menstruation normal.

Examination: Nose—some redness inside. Some inflammation of tonsils, left embedded. Right thyroid three times normal size. Cardiac pulsation, very rapid. Abdomen and pelvis negative. Urine negative, blood pressure 140/60, temperature 99.6, hemoglobin 80 per cent. W.B.C. 7,300. Basal metabolism +57, pulse 110-140.

Diagnosis: Exophthalmic goitre.

Operation: 1. April 22, 1922. Anesthetic—novocaine and gas. Right inferior artery ligated with plain catgut No. 1. Left inferior artery ligated. Right superior artery ligated. Part of central portion of right lobe included in addition suture. Pulse when left hospital 110-120. Improved. June 6, 1922, temperature 99.8, pulse 132, weight 97½, generally

well, but quite nervous. Sept. 13, 1922, temperature 99.4, pulse 90-100, hemoglobin 75 per cent, blood pressure 135/70. Still quite nervous.

2nd operation. Sept. 16, 1922. Anesthetic—gas and ether. Pulse 118-120 before operation. Respiration 28. Three-fourths of right lobe removed, removing inner diseased portion. Hemorrhage controlled by plain catgut suture back and forth. Gradually improved and left hospital in fairly good condition, but somewhat nervous. Pulse 98. Oct. 18, 1922, temperature 99.2, pulse 140-160, weight 106½, hemoglobin 80 per cent, blood pressure 130/76, looks well, feels good. Feb. 28, 1923, examination showed slight mitral stenosis. Thyroid considerably enlarged and soft. Operation postponed until in better condition. Basal metabolism +18.

3rd operation. April 20, 1923. Anesthetic—local and gas. Pulse before operation 120. During operation 160-140. Most of inner left thyroid removed. Capsule stitched with plain catgut. There were many adhesions present. The right thyroid was about normal size. Discharged from hospital May 3, 1923. Condition good. Pulse 110.

Specimen: April 20, 1922, hypertrophy of thyroid.

Results: Patient improved very much. Oct. 16, 1923, blood pressure 130/74, pulse 90, weight 116½. Feels very well.

Owing to the lateness of the hour no further cases were reported.

The meeting adjourned.

JOHN E. HYNES,
Secretary.

TRANSACTIONS OF THE MINNEAPOLIS SURGICAL SOCIETY

STATED MEETING HELD DECEMBER 6, 1923, THE PRESIDENT,
J. M. HAYES, IN THE CHAIR

DR. J. FRANK CORBETT: I have a rather interesting case of rupture of the middle meningeal artery. Rupture of the middle meningeal artery is a comparatively common thing, but we usually expect a certain sequence of symptoms. We have an individual who has been struck on the head, who is perhaps momentarily unconscious but after a few seconds recovers consciousness, walks and talks and acts as usual, then after six or eight hours, on careful examination, we find certain changes have taken place. The reflexes are relatively quickened at first. Then at a little later period we find a flaccid paralysis and perhaps aphasia, and a little later complete unconsciousness and interference with respiration and other medullary symptoms. That is the classical picture of hemorrhage from the middle meningeal artery, a progressive condition.

It is not the only form under which we encounter this condition, and this patient that I bring before you tonight—she has kindly offered to come here—is unusual in that within five minutes of the time that she was struck with an automobile she was completely unconscious. When I saw her in the hospital she was not only completely unconscious, but the respiratory centers were seriously involved. It

looked as though death was almost certain. On examination I found extreme choking of the discs; the patient was in shock; failure of respiration was imminent. That led me to at once open into the head, and I found an enormous hemorrhage around the middle meningeal artery. I emptied this clot out and ligated the artery as quickly as I could and got the patient back to bed. The next day she was paralyzed on one side and had a complete aphasia. This paralysis lasted for about a week and the aphasia began to improve after seven days. I think you will see before you a perfectly normal child in body and mind. She has gone back to her school work and is making progress.

The only excuse I have for bringing this case before you is the fact that it was a case where an immediate operation was clearly indicated and yet the picture was perfectly atypical.

DISCUSSION

DR. H. B. SWEETSER: How long after the injury was it before you operated?

DR. CORBETT: I operated immediately. I think I saw the child within two hours after the accident.

DR. BAXTER: Had the blood clotted?

DR. CORBETT: Yes, there had been some clotting of the blood.

DR. MAXEINER: What were the landmarks?

DR. CORBETT: Well, the middle meningeal starts at the foramen spinosum, traverses the middle cranial fossa upwards and forward. You may have a rupture anywhere; the typical place is an inch and a half above the zygoma and an inch and a quarter behind the external angular process. However, it may be ruptured any place.

DR. H. B. SWEETSER: Did you find any cranial fracture?

DR. CORBETT: Yes, there was a fracture of the skull. It cut this artery off. The artery must have been unusually large and the hemorrhage very rapid. That is why we had the early appearance of symptoms.

DR. M. F. LYNCH: Case report of ovarian tumor with twisted pedicle in child of ten years.

This patient was first seen by me at her home in this city about 9 P. M., Saturday, August 17, 1923, and the following history obtained:

The family history is unimportant. The parents are healthy, and have two children, the patient, aged ten, and a younger sister, aged seven.

Personal History.—Patient was a full-time, well-developed baby. Labor normal. Mother nursed her for six months. When the patient was two days old, there was a bloody discharge from the vagina, which lasted for four or five days. There was no bleeding from the mouth, bowel or navel, and the child was not ill. The mother stated that the child developed normally, and has been healthy except for the following diseases of childhood: Whooping-cough at two years, and measles at three years. She has had several mild attacks of acute tonsillitis, and had "flu" in 1918. She has always had slight constipation.

Since April of this year she has had repeated attacks of mild abdominal pain. These attacks have generally come on a short time after eating, and were relieved by laxatives. These attacks have recurred from two to three weeks apart,

sometimes the pain was associated with vomiting, but more often she did not vomit.

Habits: Appetite good. Sleeps well. Healthy, happy child, up to normal weight.

Present Complaint.—Saturday, August 17, 1923, shortly after the noon-day meal, she was taken with cramp-like pains in the lower abdomen. She vomited repeatedly, and was very restless during the afternoon and evening. There had been no movement of the bowels that day, but during the afternoon she went frequently to stool, without result.

Examination.—Patient is a fairly well-nourished child, tossing about the bed in great discomfort. The face is flushed, the skin clear and moist with perspiration. Pupils are equal, and react normally. Teeth are in good condition. Tonsils are somewhat enlarged, but show no active disease. Movements of the head and neck are normal, and no palpable cervical glands found.

Chest: The chest is rather long and narrow. No tenderness on palpation. Normal heart dullness. No indication of disease of heart or lungs.

Abdomen: The abdomen appears somewhat distended. No visible peristaltic waves. The umbilicus protrudes somewhat, but no hernia is present. The abdominal muscles are rather tense and alike on both sides. The only definite tenderness is at a point corresponding to McBurney's point, but on the left side. This is constant on repeated examinations. No mass or dullness can be brought out by percussion. Palpation about the kidneys and spleen negative. Liver dullness is normal, and costal margin cannot be felt. Both groins are negative for hernia or adenopathy. The temperature at this time was 98; pulse, 80 and of good quality.

Diagnosis and Treatment.—The patient had just returned from a two weeks' camping and motoring trip, and when she was somewhat relaxed by a suds enema, it was thought her trouble might be due to a food disturbance. The following morning I saw her again. She had had a very uncomfortable night, and slept but one short interval. Her temperature was normal, pulse 90, and she had developed considerable rigidity of the abdominal muscles. This was most marked on the left side, with the same point of tenderness as before.

A rectal examination was made at this time, but was unsatisfactory. An indefinite resistance could be felt in front and above the rectum. Enema of milk and molasses produced a free evacuation of the bowel, and ruled out a true obstruction. The pain and discomfort was not relieved, and later she developed a constant desire to urinate.

A diagnosis of a possible obscure appendicitis, diverticulitis or volvulus was made, and immediate operation advised. She was admitted to St. Mary's Hospital, and operated upon the same day.

Pre-operative laboratory findings were: Urine—clear, sp. gr. 1.025, acid reaction, no sugar, no albumin, microscopic negative; blood-leucocytosis 19,850, no differential made.

Operation.—The abdomen was opened under gas and novocaine anesthesia, with right rectus incision near the mid-line. There was a small amount of free fluid in the peritoneal cavity. The transverse colon hung low across the abdomen. The appendix was free and quite normal in

appearance. When the pelvic organs were exposed, the right tube and ovary appeared normal, and led the way to a small uterus. There was a dark necrotic mass behind the uterus about the size of a small grapefruit, and filling the brim of the true pelvis. When this was lifted up, it exposed a pedicle that was twisted four or five times in itself and embraced the left tube, which was also necrotic. There were no adhesions present. The pedicle was tied off with the left tube and the stump turned in against the left broad ligament. The tumor appeared to be a simple unilocular cyst that involved the whole left ovary. The outer covering was smooth, the wall rather thick, and the cyst filled with fluid.

The wound was closed without drainage. She made an uneventful recovery, and was discharged from the hospital on the seventh post-operative day.

Pathological Report.—The following report was furnished by M. Schelender, director of the laboratory at St. Mary's Hospital:

"Doctor E. T. Bell, of the University Medical School, has kindly examined the specimen and microscopic slides with this result: Ovary is 10 cm. in diameter, consists of single large cystic cavity 9 cm. in diameter, walls $\frac{1}{2}$ cm. thick. Contents—dark red and hemorrhagic in appearance, semi-fluid consistency, not definitely oily. No teeth visible; no hair recorded. Walls appear smooth."

A microscopic section through the wall showed a layer of stratified squamous epithelium with cornification of the free surface, many hair follicles and a few sweat glands beneath the epithelium. Extensive diffuse hemorrhage was present throughout the wall in many places. Small muscles were seen attached to the hair follicles.

Diagnosis: Dermoid cyst.

As to the frequency of dermoids, Ewing states they constitute about 10 per cent of all ovarian tumors. They appear at all ages, often in childhood, but most frequently between the ages of thirty and forty.

F. W. Lynch, in his work on pelvic neoplasms, quotes the following authors as to frequency of dermoids:

Olshausen, 4 per cent (in 2,275 ovarian tumors).

Howard Kelly, 18.8 per cent.

Sawyer, 18.7 per cent.

Mayo Clinic, 10 per cent (about).

DISCUSSION

DR. H. B. SWEETSER: I would like to ask Dr. Lynch what percentage of cases have a twisted pedicle, if he has looked that up.

DR. LYNCH: It seems that quite a large percentage come to operation on account of complications, and that is one of the commonest complications. I do not know the exact percentage, but I know that in the London Lancet for April of this year there is a case reported of a dermoid cyst in a fetal head in an infant of five months, with a twisted head that strangulated the uterus. It is a common complication, and it is a thing that seems to bring the children to operation.

DR. S. R. MAXEINER: I am going to give you only a very few words on this case, but I thought it was interesting to present. It is a boy of twelve; family history is negative;

previous diseases are negative. Last Friday, the 30th of October, he was hunting near Savage, with a playmate, when a .22 rifle was accidentally discharged and a bullet entered his abdominal cavity. The wound was about two inches above and just to the right of the navel. We took him to the x-ray room and localized the bullet in the lower left quadrant of the abdomen posteriorly. Localization and the x-ray plate showed that the bullet had penetrated the ilium and was lodged in the left buttock. He was taken to the operating room and given hypodermoclysis. Before we started, his condition was reasonably good. He was matched for blood transfusion, but this was found to be unnecessary. The abdomen was opened by a vertical incision through the left rectus muscle, because the bullet had taken a course toward the left pelvis. On opening the abdomen we found the ileum in about its mid-portion was penetrated through and through, making two perforations. The bullet then passed across the abdomen and made an in-and-out perforation of the descending colon. The perforation in the descending colon was both on the anterior and posterior surface, the posterior one being retroperitoneal. The ileum was so torn that in the repair of the bowel it virtually resulted in an end to end anastomosis. In repairing the sigmoid the peritoneum on the outer side was divided and the descending colon was rotated so as to preserve its blood supply, and the repair was made from the posterior surface.

The pelvis was drained; a drain was inserted behind the colon into the retroperitoneal space, and another drain along the outer side of this colon; a fourth drain directly into the abdominal cavity. It is six days tonight at just about this time that we operated upon him. I will show you the temperature and pulse record. His temperature and pulse records are both normal now. He was done under local anesthesia, absolutely without pain. The child's condition was fully as good at the close of his operation as it was at the beginning.

He had peritonitis as we expected, and the abdominal wall showed some rigidity and a very slight distention. This is entirely gone now, and there is only one drain remaining at this time.

DISCUSSION

DR. RISHMILLER: What size bullet was it?

DR. MAXEINER: Twenty-two.

DR. BAXTER: I would like to ask Dr. Maxeiner how he located the perforation in the extraperitoneal portion of the descending colon.

DR. MAXEINER: I had localized the bullet before hand and marked the skin with the vertical ray from the x-ray and also its depth. I had these marks to go by and I knew where the bullet was. I knew its course absolutely. We had the perforation on the free peritoneal side and I knew that there must be one on the other side. I simply freed the colon so that I could expose the posterior surface of it and rotated it over and it came directly in view. The perforation on that posterior surface was very small.

Paper of the evening given by Dr. Brophy, Chicago: "Fundamental principles and recent conclusions in surgery of congenital cleft palate." (Paper and discussion to appear in MINNESOTA MEDICINE at a later date. Ed.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH
THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

ENDOCARDITIS LENTA: Carey F. Coombs (Quart. Jour. of Med., July 1923). This article is based upon 30 cases of chronic ulcerative endocarditis. Males predominate (29 of the 30 cases). The average age was 30.6, the extremes being 20 and 44. A history of rheumatic infection was present in only 11 of the 30 cases, quite in contrast to previous considerations. These patients had, however, a striking etiological factor in the excessive fatigue occasioned by strenuous military service. No particular route of infection was determined nor could much be made of the figures indicative of lowering of resistance by general infections. Almost without exception the condition developed in men of fine physique, who had exerted themselves to the utmost of their physical powers. The possibility of an increased lactic acid content of the blood making a more favorable media for the invading micro-organism is suggested (reference to Walker Hall, Jour. Path. and Bact., Cambridge, 1922, XXV, 19 and 297).

The aortic valves, rather than the mitral, were attacked with remarkable consistency. The organisms were few in number, difficult to find (those that have been found, non-hemolytic streptococci), and difficult to cultivate on artificial media. The vegetations themselves were not very productive; the valves often much sclerosed and with considerable deposits of lime. Little or no polymorphonuclear infiltration was present, the reaction being rather proliferative in character. Renal changes brought about by emboli were generally present. No evidence of previous cardiac infection was found in most cases. Blood cultures were consistently negative.

Symptomatology: The course of the disease was extremely insidious; general loss of flesh and strength; pallor; dyspnea. Many of the patients for a long time refused to consider themselves ill. The ill health may be apparent for months before physical signs relating to the valve develop. Enlargement of the spleen noted in 52 per cent; slight and occasional rises of temperature in 61 per cent; petechiae were found in 50 per cent; red blood corpuscles in the urine in 54 per cent; albumen in urine in 65 per cent; anemia; clubbing of fingers. Retinal hemorrhages were noted in three cases. The slow course of the disease was illustrated by one case, the duration of which was three and one-half years. Treatment was of no avail.

A previous article on Chronic Ulcerative Endocarditis by the same author appeared in the Quart. Jour. of Med., 1921-22, XXV, 114.

T. A. PEPPARD.

THE MODERN METHODS OF TREATING LOBAR PNEUMONIA: Henry M. Thomas, Jr. (Amer. Jour. of Med. Sc., Dec. 1923.) Thomas' recommendations may be summarized as follows:

In view of the sharp, sudden and severe type of toxemia of lobar pneumonia, and with its relatively short duration, a reasonable, wholesome diet, without any undue restrictions, is indicated. Three to four thousand c.c. of fluid should be administered daily in order to favor elimination, and in the event of vomiting or delirium liquids by mouth should be supplemented with subcutaneous injections or a slow proctoclysis. Absolute bed rest should be insisted upon, and no active movements allowed on the part of the patient. The physician and nurse should insist on absolute obedience in this respect.

The question of digitalis, Thomas does not answer very emphatically, although he believes that digitalis is indicated to the limit of threshold digitalization, and is urgently indicated with the first evidence of myocardial insufficiency. If sudden heart failure intervenes the use of morphine and atrophine, or even venesection, is admissible. If additional stimulation is required, caffeine sodium benzoate and camphor in oil are available stimulants. Careful hydro-therapeutic measures, in the form of sponging every few hours, are of value, but one must not employ it ill advisedly. For the abdominal distention occasionally found as a result of the severe toxemia, turpentine stupes, high rectal tubes or turpentine enemata are of value, and pituitrin may be supplemented hypodermically to reduce it. It may be necessary in obstinate cases to eliminate milk from the dietary. In early cases when pain is a troublesome symptom, morphine is frequently required in small doses, and an ice bag may be applied locally, or a tight chest binder. The administration of oxygen is of value if cyanosis and dyspnea become prominent symptoms. Fresh, cool air is of proved value.

In discussing the specific therapy, the writer states that the Type I pneumococcus serum as developed by the Rockefeller Institute is the only one that has received enough of a trial to warrant discussion. Kyes' chicken serum proved of value with the Cook County Hospital, where a reduction in the mortality rate from 45.3 to 20.8 per cent was brought about, but no further statistics are available. The immune serum from convalescent patients, as suggested by Dr. Stengel, is attended by technical difficulties and also by theoretical objections. Prophylactic vaccination with the killed cultures of Type I, II and III pneumococcus seems to be of value in lessening the incidence of respiratory infections and pneumonia, as well as their severity. Thomas believes that hypodermic injections of quinine in high solutions are of value as a specific chemical agent, and he wishes to call attention to a quinine derivative prepared in Germany under the name of "Numoquin," which he believes may prove to be a valuable adjunct to our armamentarium. In his experience, and from his review of the literature, he believes that the Type I pneumococcus serum is of value in lowering the mortality rate.

F. J. HIRSCHBOECK.

SURGERY

SUPERVISORS:

E. MENDELSSOHN JONES,

LOWRY BLDG., ST. PAUL

VERNE C. HUNT,

MAYO CLINIC, ROCHESTER

FRACTURES OF THE ELBOW JOINT AND OF THE LOWER END OF THE HUMERUS: Edgar Lorrington Gilcrest (Surg., Gyn. and Ob., Vol. 37, October 1923). In treating fractures of the elbow joint and lower end of the humerus the anatomical relations should be borne in mind and the x-ray should not be solely relied upon to give us information of the anatomical deformities.

In children fractures in this location are often the result of indirect violence, and in the adult of direct violence. Ten varieties of the lower end of the humerus are mentioned:

1. Supracondylar (over one-third of cases of fractures of lower humerus).
2. Diacondylar.
3. Intercondylar (frequently compound, usually in adults due to direct violence).
4. Separation of the lower epiphysis (very infrequent; occurs in childhood).
5. External epicondyle (rare; result of direct violence).
6. External condyle (occurs in about 17 per cent, frequently in children).
7. Internal epicondyle (usually occurs from hyperabduction of elbow fully extended).
8. Internal condyle (unusually rare).
9. Capitellum (only seventeen cases reported in literature).
10. Trochlea.

The fully flexed position with bandaging to chest is the treatment for fractures in the vicinity of the elbow joint, with the exception of fractures of the olecranon process, for the following reasons:

1. It gives the most complete anatomical reposition of fragments and the best fixation.
2. It favors the retention of the more important flexion function of the joint.
3. It co-operates with gravity in the subsequent restoration of function.

The elbow is slowly but firmly flexed after reduction is established by strong traction on the forearm with the elbow fully extended and supinated. After two weeks the forearm can be lowered a few degrees a day and passive motion is started in about four weeks. Any pain production from these procedures should indicate rest in corrective manipulations.

Fracture of the olecranon process is due to direct injury and is frequent in adult life. Extension of the elbow for two or three weeks is the treatment for this. Fibrous union with a gap is nearly always satisfactorily treated by operation, but is infrequent.

Fracture of the coronoid process is treated by complete

flexion. Fracture of the head or neck of the radius is treated by full flexion. If obstruction to supination should occur, the fractured piece should be removed. Excess callus formation is prevented by not introducing any motion early. The author pleads for early reduction whenever possible.

Volkman's contracture, traumatic myositis ossificans, ulnar nerve or median nerve injury, and permanent restriction of movement from excessive callus formation in the fossae are the complications to look out for.

The operations indicated are not numerous and are as follows:

1. Removal of head of radius as mentioned.
2. Replacement of the epiphysis when it has been detached and turned turtle.
3. Excision of fractured fragments of the capitellum and trochlea.
4. Repair of co-existing nerve injury at the earliest possible movement.
5. Open reduction of any fracture not capable of being reduced otherwise.

A functionally good joint is the goal and not necessarily a pretty looking one.

There are a number of illustrations of several cases reported by the author.

V. C. HUNT.

DIVERTICULA OF THE URINARY BLADDER: W. E. Lower (Surg., Gyn. and Ob., August, 1923). Diverticula of the urinary bladder have become known as frequent occurrences only in recent years, through the advent of the cystoscope and cystographic examinations.

The etiology of diverticula is unsettled. Increased activity of the bladder musculature, secondary to some form of obstruction at the urinary outlet with a congenital predisposition to diverticula formation, seems to be generally accepted as the most likely etiological factor.

Diverticula present no specific symptoms. Their presence should be suspected, however, in any case in which difficulty of urination, frequency, and pyuria exist in concomitant conditions; also, wherever there is persistent pyuria, especially after repeated irrigations. Any abnormality of micturition should be an indication for a cystoscopic examination of the bladder, and this should include an anteroposterior plate and at least two plates taken from different angles.

An infected diverticulum can be cured only by complete removal. The author's method of procedure in good sized diverticula is, dissection of the diverticulum free from surrounding structures after it has been stuffed with gauze or cotton, followed by excision at the neck and closure by turning in the mucous membrane. A small diverticulum which can be readily everted into the bladder, can be removed intravesically. Any cause of obstruction should be appropriately treated. If a ureter opens into a diverticulum, as frequently happens, it should be transplanted.

Operation should not be delayed once the diagnosis has been made.

W. P. HERST.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,
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ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

DIAGNOSIS OF CONGENITAL SYPHILIS IN INFANTS AND NEW-BORN: A. B. Marfan (*Presse Med.*, Paris, April 25, 1923). The diagnosis of congenital syphilis rests on the following clinical signs:

Pemphigus is relatively rare but generally exists at birth or within ten days after birth at the latest. It involves the palms and soles, and is to be distinguished from epidemic pemphigus, which spares these areas, and is never congenital. The presence of syphilitic pemphigus is of grave prognostic significance, few children so affected recovering.

Coryza is of prime importance, is an early sign and often the only one present. The only form of coryza which may offer diagnostic difficulties is diphtheritic rhinitis. Diphtheritic rhinitis is never congenital, and a bacteriologic examination usually settles the diagnosis.

Chronic early megalosplenitis is sometimes observed at birth and may, in connection with a variable degree of anemia, constitute the only symptom of syphilis. An appreciable enlargement of the spleen may be detected in about 77 per cent of heredo-syphilitic children under three months. Megalosplenitis up to this age has practically a pathognomonic value.

Syphilids are relatively rare. Macules similar to the roseola of acquired syphilis usually appear toward the end of the first month. They have two zones of predilection: on the face (lower lip, chin or neck), and on the external surface of the thighs. Syphilitic papules may develop from macules or appear independently. They occur a little later, and are almost never observed after the fourth month. Their usual sites are the face, lower limbs and ischiatic regions. Lesions similar to mucous patches may be observed in regions where two moist cutaneous surfaces are in contact with each other. Condylomas occur only in older children and are thought to be a manifestation of acquired syphilis. The syphilids of infants become ulcerated only in exceptional cases.

The syndrome of pseudoparalysis of new-born syphilitic children (Parrot's disease) generally occurs toward the sixth week, and almost never after four months. One or several limbs are inert, flaccid, and motionless. The limbs are not really paralyzed, but the movements are very painful. Sometimes a swelling may be felt in the region of the epiphysis, and even crepitus in the rare cases in which the diaphysis has become separated from the epiphysis.

The above signs are pathognomonic, but may all be lacking after about the sixth month. A diagnosis may still be made, however, from association of other signs, and by laboratory methods.

CHESTER A. STEWART.

BLEEDING FROM THE RECTUM IN INFANCY AND CHILDHOOD. Arthur A. Landsman (*Arch. of Ped.*, August, 1923). Rectal bleeding may arise from a variety of causes, local and general. There are many symptoms which may be borne for long periods, though quite annoying, without any particular danger to the individual, because they do not interfere with processes which are vital to life, or affect our reserve forces sufficiently to prevent function from being carried on. This is not true of loss of blood; steady bleeding, even in small amounts, is certain to be followed by such serious consequences as to make it necessary to check it without any loss of time. But if we are to secure more than temporary relief, the cause of the bleeding must be found. Any one of the disturbances which are held responsible for rectal bleeding in older children may be theoretically present in infants, but as a matter of practical experience there are only two which require any extended consideration in this connection—congenital syphilis and lesions which arise from developmental faults. In congenital syphilis the cause may be found in epithelial erosions, ulcerations, condylomata, fissures, cracks and other manifestations of lues, while those due to developmental defects owe their origin to some fault or modification in growth occurring in the lower end of the intestinal tube during prenatal life. While older children, who are brought to the proctologist for investigation of hemorrhage from the bowel, may also be the victims of diseases which affect those who are younger, yet in them, generally speaking, other conditions prevail which are sources of bleeding; these are polypi, prolapse of the rectum, invagination of the bowel, ulceration, fissure, foreign body and abscess. Prolapse of the rectum is relatively common in children up to 4 to 5 years of age and is accompanied by slight bleeding with or after stool.

Ulceration of the rectum is caused by a number of diseases, any one of which may give rise to symptoms of bleeding, varying from a few drops to a brisk hemorrhage. These are syphilis, tuberculosis, malignancy, amebiasis, the presence of intestinal parasites, gonorrhea and proctitis due to toxic causes. Gonorrheal ulcers occur most frequently in female children from a dribbling of the vaginal discharges in those who are so affected.

Fissures of the anal skin are seen in children of the undernourished type, who are suffering from constipation or diarrhea; they are not infrequently caused by straining or by the trauma inflicted by the careless use of the nozzle of the fountain syringe. Piles occur in infants and older children with extreme rarity, and are only mentioned here to emphasize this fact. Many cases diagnosed as piles, both in the child and in the adult, are really other forms of rectal diseases.

R. N. ANDREWS.

A COMPARISON OF THE VALUE OF MILK AND ORANGES AS SUPPLEMENTARY LUNCH FOR UNDERWEIGHT CHILDREN: Margaret S. Chaney (*Amer. Jour. of Dis. of Child.*, October 1923). One of the most common methods of overcoming undernutrition among school children is the introduction of a supplementary lunch, consisting usually of milk and crackers. Sherman and Hawley have recommended a diet containing a quart of milk a day and a normal allowance of other foods. This

will furnish a gram of calcium a day for the growing child, the amount which they have found necessary to induce optimum storage of calcium. However, it has been forcefully demonstrated by many investigators that all milk is not of equal food value since its vitamin content is altered by the fodder of the cow and also by the application of heat. Hess, while he advises the use of milk because of the security it provides against infection, states that it is an incomplete food, and a contributing cause of infantile scurvy.

Another point to be considered when milk is to be fed as a midmorning lunch is its satiating effect. In many instances, a glass of milk taken between meals or at the beginning of the meal will cause lack of appetite; and, as the undernourished child already has a tendency to diminish his food intake, this may be a more serious consideration than it appears on the surface.

Oranges also are a protective food and have an important place in the diet. Experimental work on the values of orange juice in infant feeding goes to prove that it is important not only as a source of the antiscorbutic vitamin, but also as a stimulant of appetite. Babies not gaining normally on the ordinary amount of orange juice (15 c.c., as fed by Daniels) receive a marked stimulation to growth when 45 c.c. is administered.

In ascertaining the state of well being of the child, environment and social standing as well as the physical conditions of the body are to be considered. The most common physical defects causing undergrowth and poor nutrition are caries and infected teeth, and enlarged and infected tonsils and adenoids. New Para oranges apparently are superior to milk as fed to the children involved in the test. The orange lunch instead of decreasing total food intake is likely to increase it, owing to the water-soluble vitamin in the orange.

Concentrated bottle orange juice appears to be of marked value in stimulating growth in the underweight child. While it has not proved equal to fresh oranges, it is quite effective, and may, if the fresh fruit is not available, supply the vitamins necessary for growth.

R. N. ANDREWS.

WHAT CURATIVE DIETS ARE NECESSARY FOR THE INFANT: Langstein (*Monatschr. f. Kinderhik*, Leipzig, January-February 1920). The poor quality of milk since the war has led to discontinuance of the one-third milk formula, which has been replaced by more concentrated mixtures. Langstein uses whole milk, half milk, two-thirds milk, breast milk and buttermilk. Breast milk is the best curative diet and cannot be replaced by albumin milk. For infants with acute diarrhea, breast milk, preferably, in combination with buttermilk gives best results. Buttermilk with addition of a little flour and sugar makes all other curative diets superfluous, even albumin milk, and is indispensable, even though many nutritional disorders may be treated successfully with ordinary milk formulas. Generally, curative diets are continued too long. It is unwise to give albumin milk for six to eight weeks, for disorders may develop which are often not immediately manifested clinically.

CHESTER A. STEWART.

RINGWORM AND ITS TREATMENT: James Robertson (*Arch. of Ped.*, August, 1923). The writer describes his method of treatment of ringworm which he has used in the School Clinics in Blackburn, England, since 1920. The hair is cut short; the affected parts are shaved; the areas are washed with ether soap and dried. Then the following lotion is carefully applied with gentle rubbing: Calomel, 5 grains; tincture iodine, B. P., one drachm. This lotion is poured on small pieces of absorbent cotton and applied to the areas; then a dressing is applied. The next day the dressings are removed and the areas washed with ether soap, ammoniated mercury ointment is applied and then a dressing and bandage. This is continued until the case is cured, which is usually within 14 days. The lotion is applied only once; it seems to penetrate and kill the parasites. If the whole scalp is affected then it is the custom to apply the lotion to one-sixth of the total area each day for six days. Ringworm of the body receives the same treatment, in which cases the condition is cured within 48 hours.

R. N. ANDREWS.

THE SIGNIFICANCE OF HEMATURIA IN CHILDREN: J. D. Leeborn (*Arch. of Ped.*, September 1923). This is not as common in children as it is in adults. Its occurrence is one of the most important manifestations of disease of the urinary tract in early life. There are two problems to solve in the presence of hematuria—the source, and the cause. It is very important to remember that a bleeding bladder is difficult to wash clear. Hematuria of renal origin is a total form. "It is always the result of a rupture of blood vessels which may be occasioned by many causes" (Jacobi). The urine shows a uniform discoloration from the beginning to the end of micturition. The three chief causes of renal hematuria are tuberculosis, stone and new growths. Certain mild vesical symptoms present themselves in incipient tuberculosis of the kidney. These are frequent urination, a slight, purulent deposit at the bottom of the vessel and mild pains in the bladder. In renal calculus, hematuria often appears abruptly without any previous attack of pain, while in other cases, pain is a prominent feature. Hematuria in new growths of the kidney may appear very early and may be the only symptom. In fact, sudden, profuse, painless hematuria should at once suggest nephritic neoplasm. Nephritis associated with hematuria, with or without pain, is of relatively frequent occurrence. Hematuria of hemic origin is a rather common occurrence in children. These are purpura, hemophilia, rickets, scurvy and the leukemias. Hematuria often follows certain forms of poisoning such as cantharides, phosphorus, turpentine, phenol and hexamethylenmin.

The treatment of hematuria depends largely upon the cause. The hemorrhage in itself is a symptom, rather than a disease. Rest and local application of cold, in the form of the ice bag, is indicated in all cases of profuse hematuria. The patient should be kept in bed and kept on a milk diet. The underlying principle of treatment is the removal of the cause of the condition. Palliative treatment is inexcusable except as it is temporarily resorted to during a careful search for the etiology.

R. N. ANDREWS.

GYNECOLOGY AND OBSTETRICS

SUPERVISORS:

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THE TREATMENT OF THE PREGNANT WOMAN WITH PULMONARY TUBERCULOSIS: M. Voron (*Gynecologie et Obstetrique Revue Mensuelle*, Tome 8, No. 2). The author gives an exhaustive review of the French literature on this subject, in which he presents the arguments and experience of the opposing schools, namely: those who recommend the routine interruption of pregnancy, and those who withhold all intervention. After a detailed discussion of the question involved and consideration of his own results he presents his conclusions as follows:

I. The treatment of the pregnant woman having pulmonary tuberculosis should be neither systematically conservative nor radical intervention, but each case must be treated according to circumstances and environment, independent of any preconceived ideas.

II. Treatment will be entirely medical:

1. When the pregnancy has passed three months independent of the nature and extent of the pulmonary lesions.

2. In cases of grave advanced tuberculosis, or in the quiescent or fibrous stage.

III. Interruption of the pregnancy may be considered when:

1. Pregnancy has not passed three months.

2. There is a tuberculous lesion definitely active, but is definitely curable in the opinion of competent observers. Intervention will be contra-indicated when the clinical and social conditions are such as to offer good hope of cure by medical treatment alone. Interruption of pregnancy will be limited then to patients presenting bilateral lesions still curable, usually in women of the working classes who are not more than three months pregnant. It is to be considered only in the exceptional cases, and the treatment will be medical and hygienic in the vast majority.

IV. When indicated, intervention will most often consist of induced abortion. Hysterectomy is reserved for women near the end of the childbearing period, who have borne several children, and who must be protected from further risk. Sterilization without hysterectomy has some advocates.

V. Physicians and obstetricians should realize that severe aggravation of tuberculosis is common during the puerperium. That medical and hygienic treatment should be instituted early in pregnancy and carried out rigidly throughout the puerperium. That intervention which is found to be favorable in some cases should always be considered during the early period at which it is permissible, namely, during the first three months of pregnancy.

ARCHIBALD L. McDONALD.

THE CALCIUM AND MAGNESIUM CONTENT OF THE BLOOD SERUM DURING PREGNANCY, LABOR, AND THE PUERPERIUM: E. R. Plass and L. Jean Bogert. (*Am. Jour. Ob. and Gyn.*, Vol. 6, No. 4.) This interesting piece of work was carried out in order to study the toxemias of pregnancy. They examined the calcium content of 205 normal, nonpregnant, pregnant, parturient, and puerperal women. Several observations were made on women suffering from toxemia of pregnancy. A number of analyses were made for magnesium but as no marked variations from normal were found, these were abandoned. The authors give an excellent review of the literature on this subject. They studied 40 normal nonpregnant women, 105 normal pregnant women between the fifth and fortieth weeks of pregnancy, 29 women during labor, and 31 from 12 hours to 12 weeks postpartum, for the serum calcium. The serum magnesium was determined in 16 normal nonpregnant women, 29 during pregnancy, 21 at the end of labor, and 18 postpartum. They outline their methods of work and results obtained in considerable detail, and discuss the significance of their findings. They conclude: There is a distinct tendency toward a lowering of the calcium per cent during pregnancy, especially during the latter part of this state. This is not found during the first eight weeks. They feel that these lower findings do not necessarily mean a calcium deficit in the mother, but may be explained on the basis of dilution of the serum (hydropasmia), for which there is considerable evidence. The values for serum calcium in the toxemias were not much lower than those found in normal pregnant women at the same stage of gestation. The magnesium content of the serum of nonpregnant women was quite constant. It showed a tendency to decrease during pregnancy especially at labor, but probably is to be explained by the same cause as serum calcium. They were unable to prove any relationship to toxemias. Both contents returned to normal soon after labor. The serum of pregnant women showed no significant variations in the calcium or magnesium content from that of normal nonpregnant women.

ARCHIBALD L. McDONALD.

HEMORRHAGES IN THE NEWBORN: Lucius M. Wing (*Amer. Jour. of Ob. & Gyn.*, Vol. 6, No. 1). This article is of great importance to the obstetrician and is therefore reviewed in this column. The author comments on a statement that of 480 children suffering from cerebral spastic paralysis, with or without mental deficiency, intracranial hemorrhage at birth is responsible for 70 per cent of the spastic type of paralysis in children, and for 20 per cent of the idiocy and feeble-mindedness now existing. He emphasizes the fact that fatal intracranial hemorrhage may occur in a child born spontaneously in what is considered to be normal labor. More or less extensive intracranial hemorrhage is reported in from 30 to 50 per cent of the autopsies done on stillborn or newborn infants. In 59 fatal cases, 39 were vertex and 20 were breech deliveries. There was laceration of the tentorium cerebelli in 37 per cent of the total, and of these 63 per cent occurred in breech deliveries. Losee at the New York Lying-In

observed fatal intracranial hemorrhage twice as frequently in breech as in forceps deliveries. In vertex presentations, with normal engagement, and progress, the pressure effects are balanced and minimized by the support of the birth passage. More intracranial injury may occur in a few moments of unskillful forceps extraction, or forcible delivery of an aftercoming head, than from a long period of hard labor. The hemorrhage following extraction of the aftercoming head is usually in the more dangerous areas, namely beneath the tentorium or in the region of the medulla. Most of these babies are stillborn. Those which are resuscitated are likely to be limp, respiration is irregular, they become alternately pale or cyanotic, and are likely to die soon after delivery. Hemorrhage following vertex delivery is more often cortical and the prognosis is more favorable. Hemorrhage of some extent should be suspected in all babies showing asphyxia at birth, in whom resuscitation is difficult, or where the respiration is irregular. Small hemorrhages may be found in other areas: epicardium, liver, pleura, or retina. This type of baby should be regarded as a potential bleeder, and the author believes that asphyxia may have a causative influence on subsequent blood instability. Hemorrhages developing some hours or days after birth are usually associated with hemorrhagic diathesis, and are associated with bleeding in several regions: lungs, suprarenals, etc. At the Lying-In Hospital the subcutaneous injection of human serum has proven valuable if given early. 100 c.c. is given in three or four doses in the first twenty-four hours. Whole blood gives much the same result, is simpler, but may cause more local reaction.

ARCHIBALD L. McDONALD.

CYSTOCELE AND HIGH RECTOCELE: Thomas J. Watkins. (*Am. Jour. Ob. and Gyn.*, Vol. 6, No. 4.) Concerning cystocele, the author accepts as proven the following statements: (1) Cystocele is a hernia of the bladder. (2) That the lesion is essentially a tear in the vesico-vaginal floor. (3) That operative treatment must include a thorough dissection of the hernia, a firm closure of the hernial ring, and thereby, a restoration of the bladder and urethra to their normal positions. The laceration in the vesico-vaginal floor is transverse, and not longitudinal, which explains the urethral displacement. The excellent illustrations demonstrate the author's conception of the pathology and the operative procedures which he recommends for the successful correction of the condition.

Watkins' dissections of high rectoceles have convinced him that in these cases the injury consists of a tearing of the supporting fascia from the cervix and broad ligaments in a manner similar to that which obtains in cystocele. He states that the edges of the hernial ring can be dissected free and finally fastened to the cervix without undue tension. This is well shown in his illustrations, as is also the preferable method of closure. In addition, or in simpler cases alone, we may have the perineal lacerations in which the muscles are lacerated or torn from their attachments to the rami of the pubes. The article is well worthy of careful study.

ARCHIBALD L. McDONALD.

ROENTGENOLOGY

SUPERVISORS:

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ELEVATION OF THE DIAPHRAGM. UNILATERAL PHRENIC PARALYSIS. A RADIOLOGICAL STUDY WITH SPECIAL REFERENCE TO THE DIFFERENTIAL DIAGNOSIS: J. M. Woodburn Morison (*Arch. of Radiology and Electrotherapy*, Vol. 27, p. 353, May 1923; Vol. 28, pp. 71 and 111, August and September 1923). This series of well-illustrated articles represents a thorough anatomical and radiological study of the subject with report of a large number of cases. Petit's "Eventratio Diaphragmatica" and unilateral phrenic paralysis are considered together as they are practically indistinguishable clinically or radiologically. The author believes the former to be due to a developmental defect in the formation of the muscular tissue of the diaphragm. The latter are acquired and are usually due to pressure from a new growth on the phrenic nerve.

In the radiological examination, the important points to be considered are:

1. The bow line in the chest, unbroken, dome-like, the relaxed diaphragm.
2. The contents of this dome, stomach or both stomach and colon.
3. Lung tissue seen through the dome, depending on whether or not there is a hypoplasia or a consolidation of the lung.
4. Reversed movements of the bow line, upward with inspiration.
5. Fluid level of the stomach contents.
6. Palpation of the abdomen produces waves in fluid level of stomach.
7. Heart shadow seen through the dome, rotated to the right.
8. Chest wall development normal with decrease in the movements of the lower ribs and at the apex on the affected side.
9. There may be marked deformity of stomach with two sacs, rotation, or even volvulus. Gastric symptoms may thus occur. The cardinal signs are the bow line in the chest with reversed movement on inspiration.

Temporary elevations must be differentiated. Under the screen these show normal movements of the diaphragm, there is no paralysis, and they disappear in a few days. Diaphragmatic hernia is distinguished by the break in the diaphragm, with prolapse of the viscera into the chest. There is no bow line, no movements, and the position of the viscera is seen after giving an opaque meal. Localized hydro-pneumothorax, subphrenic or subhepatic abscess are easily distinguished by the opaque meal when on the left, and by the position of the liver if on the right.

LEO G. RIGLER.

OSTEOCHONDRITIS DEFORMANS JUVENILIS: Kirklin (Am. Jour. Roent., September 1923). This disease, first described by Legg in 1909, later by Calve and still later by Perthes, is usually known by the latter's name. Most of the cases reported were first diagnosed tuberculosis of the hip, as were the cases seen by the author. Its occurrence in children, often following injury, and its insidious onset resemble tuberculosis. The chief symptom is a slight limp, increasing in degree, but recovery usually occurs without much loss of function. Ankylosis does not occur. According to the author, the roentgenograms are so characteristic that the diagnosis can be made by this means alone. Frequently this is the only means of differentiating the disease from tuberculosis. The epiphysis of the femur is flattened out and the neck is broadened. This process continues until the head is a thin disc composed of several segments which may later fuse. The neck becomes broader, eburnated, and may simulate a coxa vara in appearance. The acetabulum may show osseous changes, some of which are thought to be part of the same process which is going on in the epiphysis, and some are thought to be due to the pressure changes in the joint.

LEO G. RIGLER.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

MEDICAL AND VETERINARY ENTOMOLOGY. William B. Herms, Professor of Parasitology, University of California; Consulting Entomologist California State Board of Health; formerly Professor of Zoology and Parasitology, San Francisco Veterinary College; member National Malaria Committee. 2nd edition, completely revised. 462 pages. Illustrated. New York: The Macmillan Company, 1923. Cloth, \$5.50.

THE EFFECTS OF INANITION IN THE PREGNANT ALBINO RAT. By L. W. Barry, M.D., St. Paul, Minn.

Published in the Carnegie Publications, Contributions to Embryology, No. 53.

This monograph represents the findings of an extensive research on the effects of inanition on the pregnant mother and her offspring. The work has involved the study of sufficient adequately controlled material to make the conclusions significant. "The main object of this investigation, therefore, is to show the effect of inanition in the pregnant albino rat upon the changes in the relative weights of the various systems, organs, and parts of the new-born. Observations were made also on the possibility of blighting of the ovum, death of the fetus in utero, prolongation of gestation, abortions, and premature deliveries during inanition of the mother."

"Starvation instituted shortly after copulation in the female albino rat apparently results in an inhibition of pregnancy in the majority of cases. Whether this is due to an inhibition of the implantation, or to death of the ovum, has not been proved."

Starvation during the last half of pregnancy prolonged the average period slightly.

"No abortions or premature deliveries were observed in any of the underfed rats."

One-third of the newborn from mothers starved in the last half of pregnancy were either born dead or died immediately after birth.

There is a slight diminution in average number of young per litter from mothers starved in the last half of pregnancy.

"A condition of relative sterility apparently results in females starved in the last half of pregnancy."

The average weight of the newborn from mothers starved severely during the last half of pregnancy was approximately 40% below the normal birth weight.

In regard to the detailed observations on the changes noted in the case of the various organs and systems it is interesting to note that the chief loss of weight was at the expense of the liver and lungs. The central nervous system (brain and spinal cord) was very little affected.

E. H. NORRIS.

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MINNESOTA MEDICINE

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Northern Minnesota Medical Association and Minneapolis Surgical Society*

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ORIGINAL ARTICLES

CUTANEOUS TUBERCULOSIS AND TUBERCULIDS IN DIAGNOSIS*

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Chief of Section on Dermatology and Syphilology
Mayo Clinic, Rochester, Minnesota

In the time allotted me it is of course impossible to review for you, all the varied reflections of tuberculosis in the mirror of the skin. So extensive a structure as the skin, so large an organ, one might say, with its enormous capillary circulation acting as a strainer for both organisms and toxins, must, in spite of its relative stability and resistance to internal and external attack, frequently register the onset and course of tuberculous infection. The extraordinarily wide range and clinical variety of these lesions have received monographic consideration in the writings of such observers as Jadassohn, Brocq and others, but in American literature has a comparatively restricted notice. Part of this lack of attention is, I believe, the result of general unfamiliarity with dermatology on the part of even our most alert diagnosticians. A wider acquaintance would soon extend the field of our first-hand knowledge of tuberculosis as it affects the skin, and would increase our appreciation of its value as an aid in the diagnosis of systemic disease. With this idea in mind I take this opportunity to call to your attention four aspects of cutaneous medicine in which tuberculosis plays a leading part, and to emphasize particularly the diagnostic earmarks by which the general practitioner, no less than the expert, may have his suspicions aroused and be led to fuller study and observation and to eventual accurate diagnosis.

THE APPLE-JELLY NODULE AS AN EARMARK IN CUTANEOUS TUBERCULOSIS

The accessibility of the skin to visual examination makes it possible to do in life what unfortu-

nately is denied us in tuberculosis of deeper structures, to see the tubercle in situ, by the very simple device of expressing the blood supply from the inflamed surrounding tissue by glass pressure. While tubercles do not differentiate sharply in certain types of cutaneous tuberculosis, in others are too deeply situated for observation, and in still others are usually prevented from forming by the violent destruction of tissue and organisms in an allergic

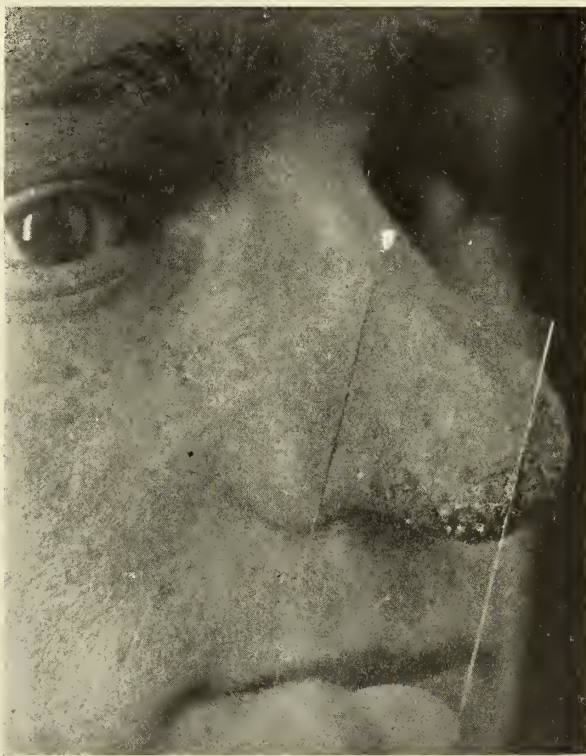


Fig. 1 (Case A187333). Early lupus vulgaris of the tip of the nose. Apple jelly-nodules demonstrable on pressure by glass slide. The preliminary diagnosis was "frost bite." Local and general reaction to tuberculin.

local tissue reaction, the cutaneous tubercle is common enough in processes such as lupus vulgaris, of the ulcerative type, in the dry lupus vulgaris erythematoides, and in certain forms of inoculation tuberculosis, to make its identification helpful in differentiating the tuberculoma from other granulomas and non-granulomatous processes.

*Read in symposium before the Minnesota State Medical Association, October 10-12, 1923, St. Paul.

The cutaneous tubercle or apple-jelly nodule is a small translucent brownish or apply-jelly colored infiltration, rarely more than 2 or 3 mm. in diameter, entirely invisible against its inflammatory background until the blood has been expressed from the surrounding tissue by pressure from some transparent object (Fig. 1). A glass slide, a glass tongue depressor or pleximeter, or an unmounted biconvex lens may be used. Even a glass paper-weight or the side of a tumbler may be utilized for emergency observation. The glass object must be stout enough to permit of a fairly firm pressure without breaking, or a severe cut may be inflicted. In a lesion which is markedly scaly or crusted, the surface should be carefully cleaned of detritus, so that no confusion from surface matter may occur. The tubercle is in the skin, not on it, almost perfectly round, flattened somewhat by the pressure, and rarely solitary. A group or chain is common, and a lesion in which only a single nodule occurs cannot thereby be proved tuberculous. Not infrequently in cases in which the local reaction to the infection is slight, as in dry lupus vulgaris, the fawn brown of the gross lesion first arouses suspicion, and when on pressure this color persists in spite of the pallor, and discrete small brownish nodules can be made out, tuberculosis is a strong presumption.

Of the conditions in which one would be likely to use this differential criterion, epithelioma and syphilis are most likely to simulate tuberculosis. Epitheliomatous cell nests are typically pearly nodules, not brown. They are usually confined to the border, rarely persisting in the scar as do tubercles. A definite telangiectasia can usually be recognized, which is not found in the avascular tubercle. The epitheliomatous "pearl" is harder, does not flatten so well under glass pressure, and shows more elevation above the surface of the skin, than a tubercle.

In late syphilids, especially about the face, the differential problem is often serious. Nicolas pointed out that the tuberculous apple-jelly nodule might be simulated by miliary gumma, and be present in syphilids of the skin which clinically resembled tuberculosis. In my experience, it is rare to see miliary gummas in considerable numbers as small as the average apple-jelly nodule. Larger nodules approaching 5 to 7 mm. are the rule. But even this criterion may fail in cases in

which nests of agminated tubercles have developed. The resemblance of a late syphilid of the face or nose to the dry erythematous, hypertrophic or even ulcerative type of lupus vulgaris may be so marked that pathologic differentiation by biopsy, by tuberculin subcutaneously, and by a therapeutic test must be resorted to in the effort to reach a diagnosis. In using the therapeutic test it is important to recall that arsphenamin has marked, though usually temporary, non-specific effects in cutaneous tuberculosis, and that even mercury intramuscularly may produce some clearing in a tuberculous lesion of this type.

In general, then, it is well worth while from the standpoint of general diagnosis, to apply glass pressure to the borders of indurated persistent plaques, small ulcerations, cutaneous nodules, and the

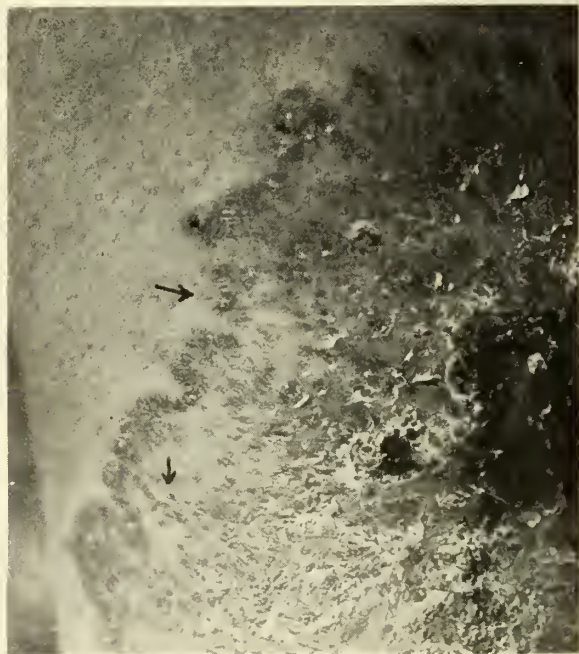


Fig. 2 (Case A256104). Lupus vulgaris erythematoides, the dry extensive non-ulcerative tuberculosis of the skin. Note the miliary tubercles in the border, two or three of them ulcerative, also the tubercles in the thin dry atrophic scar. They are easily demonstrable on glass pressure.

periphery of larger persistent patches of what may have been thought at first sight to be dry eczema, psoriasis and benign inflammatory conditions. A border of apple-jelly nodules, and the persistence of similar nodules in a dry atrophic scar (Fig. 2) may often lead to the diagnosis of a local tuberculous lesion in time to prevent metastasis or extensive destruction. A careful constitutional search

may reveal a deep focus of the greatest importance to the patient's welfare.

LICHEN SCROFULOSORUM, THE TOXITUBERCULID

The term "toxituberculid" is being attacked from all sides, the contention being that cutaneous lesions heretofore regarded as simply concomitants of tuberculosis elsewhere in the body are gradually being shown by combined clinical and experimental

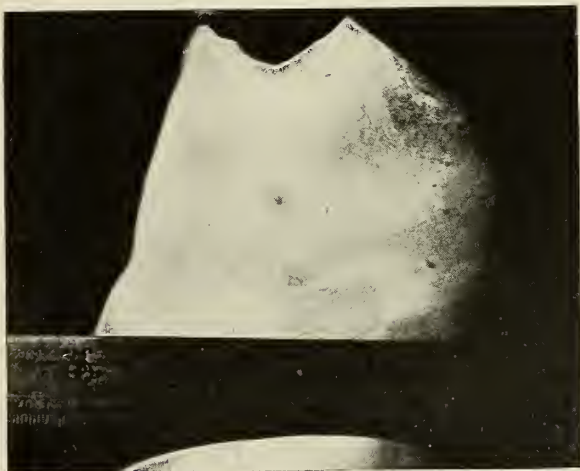


Fig. 3 (Case A319031). Lichen scrofulosorum on the flank in a young child. The patient came for a cleft palate operation and following a recognition of the lichen scrofulosorum, an examination for tuberculosis disclosed an extensive active infection with pulmonary manifestations.

study to be actual tuberculosis, caused by the organisms themselves and not by the effect of toxins from a remote focus. One type of lesion, however, seems thus far to have survived the effort to do away with the conception of toxituberculids, and that is the grouped follicular papular eruption known as lichen scrofulosorum which apparently can be produced experimentally by rubbing in tuberculin. This eruption has been regarded as a rarity in this country, though apparently common in Europe. Some of this rarity, however, may be the result of unfamiliarity.

In the clinical identification of lichen scrofulosorum, every one of the words used in the above designation of its characteristics is important. The eruption is grouped, not uniform or evenly distributed. Ten to fifty or a hundred papules are assembled into each close-set patch, and two or three up to fifty or more groups may be present (Fig. 3). The elementary lesion is follicular in character. The morphology of the follicular papule varies a good deal, especially in adults. It may be simply a follicular accentuation, the

patch resembling an island of permanent goose-flesh. There may be horny plugging of the follicle mouths (Fig. 4) though this characteristic brings it perilously close in diagnosis to the confusing elements of lichen spinulosus, follicular lichen planus, lichen pilaris and keratosis follicularis. The follicular papule is practically non-inflammatory and of a flesh or yellowish tint, which helps to distinguish it from perifollicular seborrheic dermatitis, the follicular syphilid and keratosis pilaris and follicularis. Slight hyperpigmentation of the patch of skin affected is the rule, the pigmentation being definitely less than that usually associated with the follicular syphilid. The groups or patches are usually relatively few in number, occur on the flank or in odd places on the upper extremities, and are rarely so abundant, small and widely distributed as are the groups of the follicular secondary syphilid.



Fig. 4 (Case A426165). Lichen scrofulosorum on the flank in a boy with what was at first thought to be the type of symmetrical hydrarthrosis of the knees, often seen in heredosyphilis. The identification of the cutaneous lesion led to a search which demonstrated the tuberculous origin of the process.

A follicular eruption presenting characteristics quite similar to those of lichen scrofulosorum has been recognized in recent years, and is of importance in differential diagnosis. This is the toxi-

trichophytid (Fig. 5) associated with a focus of trichophytic or ringworm infection, and especially with the macaroon-like crusted trichophytic granuloma known as kerion celsi. It is a grouped follicular eruption with a distribution and appearance suggestive of some cases of lichen scrofulosorum, but the ringworm lesion from which the intoxication is proceeding is usually easily identifiable. I have, however, seen it overlooked in the form of a patch of favus on the scalp, with favus of the nails. As in the case shown, it may consist merely of a superficial scaling trichophyte of the leg.

Lichen scrofulosorum has the reputation of being more common in children than in adults, but my experience has been the reverse of this. The lesion is apt to be more conspicuous in children, and therefore perhaps more often identified. I have observed it in association with pulmonary tuberculosis, and especially with tuberculous arthropathies, practically never with tuberculous glands, which are much more frequently accompanied by the papulo-necrotic tuberculid. A good light, a habit of critical inspection of the skin, ability to identify a follicular lesion, and some familiarity with the range of follicular lesion differentiation involved is essential. In city practice and on hospital staffs where dermatologic consultation is available, it often proves a valuable confirmatory aid in diagnosis, and may even, especially in children, set in motion an investigation which discovers an unexpected tuberculous focus.

DISSEMINATE ERYTHEMATOUS LUPUS, THE TUBERCULO-SEPTIC ERYTHEMA MULTIFORME

Lupus erythematosus is an unfortunate name, especially so because the term "lupus" leads the majority of physicians to associate the process with a true tuberculosis of the skin. To make a diagnosis of "lupus" is essentially meaningless, unless one specifies what "lupus" is meant. If one means cutaneous tuberculosis of a certain type he should say "lupus vulgaris"; otherwise he may find that he is confusing the condition with what is now regarded as in many cases a type of erythema multiforme, namely lupus erythematosus.

Lupus erythematosus presents two clinical types, the chronic discoid or localized form, and the disseminate type with systemic manifestations. The chronic type does not seem to be associated with tuberculosis in clinically recognizable form in more than about 30 per cent of cases, and for that

reason is not referred to here. The essential lesion of the chronic discoid type is a follicular inflammation with atrophy. The localization about the nose and face, forming the textbook butterfly pat-



Fig. 5 (Case A423734). The lichenoid trichophytid in a patient with a ringworm on the leg. This eruption may be confused with lichen scrofulosorum, but the trichophytic focus can always be found. Note the grouped follicular character of the eruption.

tern, is familiar to all. The frequent involvement of the scalp, producing patches of complete baldness from destruction of the hair follicles, is less familiar, and the common involvement of the outer anterior surface of the concha of the ear is also often overlooked. Acute disseminate erythematous lupus may supervene on a chronic erythematous lupus of many years' duration, or it may appear in obscure or full-blown form from nowhere. Whenever what seems to be a chronic erythematous lupus can be identified on the face, or on the scalp, and purplish patches can also be found on the fingers or backs of the hands, or when the process on the face is extending downward onto the neck and arms, a menacing situation has arisen, and dissemination may be regarded as a possibility. The situation is menacing because while discoid lupus

erythematosus is usually merely disfiguring, disseminate erythematous lupus is a highly fatal disease, with constitutional accompaniments that range all the way from imitations of typhoid fever, malaria, trichiniasis, acute rheumatic fever, and acute abdominal accidents, to cutaneous pictures suggesting erysipelas, exfoliative dermatitis and pellagra¹ (Fig. 6). In fact, repeated attacks of high fever in patients of low vitality, accompanied by any erythematous eruption (especially on the face), soreness of the mouth, falling of the hair (Fig. 7), arthritic symptoms, nephritis, or vague abdominal complaints, should prompt the most careful inves-

the tuberculous element in disseminate erythematous lupus, and its relation to the septic factor. Lymphatic tuberculosis, 'often of the mesenteric glands, and not recognized at times until necropsy, has figured prominently in our cases. The cross-fire of a tuberculous and a septic hypersusceptibility seems to underlie the peculiar clinical picture.

THE PAPULONECROTIC TUBERCULID

Lesions of the type of the papulonecrotic tuberculid, with its near relative, erythema induratum, are in my experience most valuable aids in general medical diagnosis, especially of glandular conditions; in the determination of the effectiveness of surgical procedure for the extirpation of a tuberculous focus, especially in glands; in the detection of a tuberculous factor in eye conditions and in the unravelling of obscure ill-health and asthenia in women. While the eruptive lesions themselves are frequently the occasion for the patient consulting the physician, they may, as in the papulonecrotic tuberculid of the face (acnitis), or that of the



Fig. 6 (Case A416047). Disseminate erythematous lupus simulating erysipelas and pellagra. The persistent edema and erythema of the face with alopecia with extension of the process onto the neck and the appearance of erythematous lesions on the hands is part of the cutaneous picture of the disseminating type of this disease.

tigation for disseminate erythematous lupus. This is especially important because death may follow promptly, either on the attempt to use tuberculin in diagnosis, or to remove a focus of infection in tonsils or teeth, or to explore surgically for some of the vague abdominal symptoms. The ultimate outlook is always grave, even with the best of management.

It is impossible in the time available to discuss

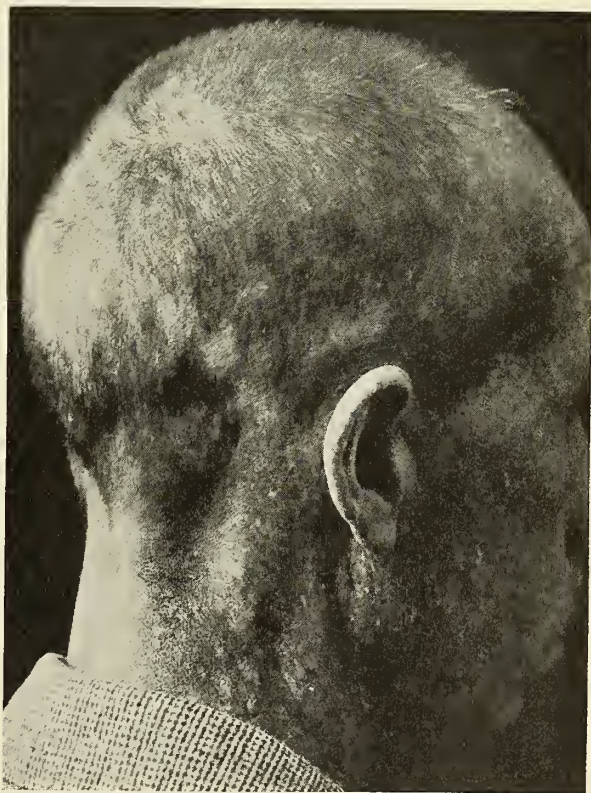


Fig. 7 (Case A364069). The alopecia of disseminate erythematous lupus which should not be confused with that of syphilis. This patient also had lesions in the mouth and on the hands suggesting pellagra. He died in a typical hyperpyrexial attack.

hands (folliclis) (Fig. 8), be disregarded as merely trifling annoyances and disfigurements, while the patient seeks relief for arthralgia, tenosynovitis, persistent anemia, amenorrhea, symptoms of pelvic



Fig. 8 (Case A228772). Papulonecrotic tuberculid on the fingers (folliclis). Note the papules with their central necrotic plugs and pits. The scars are quite characteristic. The lesions tend to localize at points of trauma. Over 90 per cent of papulonecrotic tuberculids occur on the extremities.

peritonitis and salpingitis, uveitis, retinal hemorrhages and vitreous opacities, supposed Hodgkin's disease, psoas abscess, "neurosis," or an occasional partial positive Wassermann reaction, with its accompanying diagnosis of syphilis.

To the best of our present knowledge, the appearance of the lesion known as a papulonecrotic tuberculid, means a tubercle bacilleamia, controlled by a hyperallergy on the part of the patient, which leads usually to the destruction of the organisms that reach the skin. This destruction is accomplished by a local inflammatory reaction which appears clinically as an inflammatory papule with a central necrosis. In those cases in which the tuberculosis bacilli are not entirely destroyed, tubercles and organisms may be found in the reacting tissue, especially in the condition known as erythema induratum.

It should be said at the outset that a septic, non-tuberculous factor is involved in the production of tuberculids and that the removal of such a septic focus may cause temporary or permanent improvement. One is therefore led at times to the belief that the true tuberculid may be closely imitated by what might be called a "septid."

The close generic relation of tuberculids to erythema multiforme becomes very apparent on extended study, and any considerable clinical experience will furnish instances in which a transition from one to the other occurs, or in which erythema multiforme (Fig. 9), purpura and erythema nodosum serve as the prodromal indications of a tuberculous infection, or of the miliary dissemination of the organism with a fatal issue.

In the diagnosis of papulonecrotic tuberculids it is important to learn to identify the elementary lesion. Here again the name exactly describes it, at least in its maturity. At the outset, it is usually a hemorrhagic deep vesicle or an inflammatory nodule. On the hands and fingers, the vesicular phase is best seen; on the lower extremities and face, the nodular. The papular infiltration presently develops a central necrosis, which dries into a hard, brown to blackish plug, that can be dug out, leaving a superficial ulcer or a crateriform excavation (Fig. 8). During the development of this lesion the patient complains of tenderness on pressure which, if the lesion be on the finger, gives a sensation as of a thorn or splinter pressed into the flesh. In "stasis legs" and open lesions about



Fig. 9 (Case A217298). The clinical transition from erythema multiforme to a papulonecrotic tuberculid. This patient had a tuberculous salpingitis with erythema multiforme of the backs of the hands and folliclis lesions of the tips of the fingers. Note the folliclis scars on the right index finger.

the ankles the tenderness may be exquisite. In the normal course of events, the smaller papulonecrotic lesions heal slowly, leaving depressed atrophic scars, often round and varioliform, with a faint ring of hyperpigmentation. The absence of grouping in these scars is an important aid in differentiation from syphilis.

The appearance of papular lesions in clumps may result in coalescence on the lower extremities, or large boggy plaques with central breakdown (Fig. 10) and a grumous discharge may appear without isolated papules, forming the clinical picture of erythema induratum of Bazin. The occurrence of a reddish tender plaque, or even several nodes in the calf or posterior surface of the lower leg of a young woman inclined to overweight, carries a strong presumptive diagnosis of erythema induratum and should lead to painstaking search for tuberculosis.

Tuberculids show an overwhelming tendency to localize to the dependent portions of the body, and are most often found on the arms, hands or legs. The blue, cold hand or foot ("vasomotor foot") is a common accompaniment, or perhaps better, predecessor of a tuberculid, and a careful search of blue and mottled fingers or feet often reveals the scars of lesions. Association with glandular tuberculosis in more than two-thirds of the cases, and a marked seasonal onset, with exacerbations in spring and fall, are important points. All patients with tuberculids should be searched for glandular

tuberculous foci. Roentgen rays of the chest are important. Conversely all patients presenting evidence of glandular enlargements should be searched for signs of a tuberculid. There is often no better



Fig. 11 (Case A234128). Characteristic scarring of the extensor surface of the forearms and elbows by a papulonecrotic tuberculid. Note the varioliform punctate depressed scars and the lack of any configuration which would suggest a syphilid. Note also a few active lesions with central plugs.



Fig. 10 (Case A218528). Papulonecrotic tuberculid with erythema induratum of the legs. The livid infiltrated plaque on the posterior surface is erythema induratum. These plaques often undergo ulceration. Young women who are overweight and have a tuberculous focus are predisposed to this condition. It may be closely simulated by an eruption of septic origin and should not be confused with varicose ulcer.

clinical check on a premature diagnosis of Hodgkin's disease or lymphosarcoma, than dermatologic consultation on small pimples, spots, and scars on face, fingers, and legs.

The sites which should receive special attention in a search for tuberculids are the fingers, especially those which are exposed to trauma, on which we may find the classical papulonecrotic lesions of so-called folliclis. The extensor surfaces of the forearms and elbows (Fig. 11) are often the site of typical symmetrical varioliform scarring and an occasional active lesion. Papulonecrotic lesions on the face should not be lightly dismissed as acne, which is nodular or pustular and accompanied by seborrhea and comedones, but seldom presents the necrotic plugged centers of the typical tuberculid (Fig. 12). An important point is the involvement of the external ear in papulonecrotic tuberculids (Fig. 12), giving rise in chronic cases to a shrink-

age and scarring of the lobe which I have described as "moth-eaten ear." Tuberculids about the face seem to be specially inclined to come in showers, and a shower of lesions may produce a picture ranging in differential possibilities from acne to



Fig. 12 (Case A257865). Acnitis, the papulonecrotic tuberculid of the face which is often confused with acne and the papular secondary syphilid. Note the occurrence of typical papulonecrotic lesions on the lobe and concha of the ear. The recurrence of these lesions produces the ragged or moth-eaten ear which is of assistance in diagnosis. Papulonecrotic tuberculids are associated in more than two-thirds of the cases with glandular tuberculosis. The response of these lesions to arsphenamin increases the possibility of confusion with syphilis.

variola and papular syphilis. Care should be taken not to regard the papulonecrotic lesions of acne necrotica, which are usually most abundant along the hair margin and in the scalp, as a tuberculid.

Confusion with syphilis is one of the commonest diagnostic errors arising in connection with papulonecrotic tuberculids. The undoubted occurrence with certain Wassermann technics of partial or even complete false positives on the blood in persons with tuberculids is important. The constitutional symptoms accompanying tuberculids, especially arthritic pains with anemia, seem also to lead to frequent confusion. The morphologic resemblance

of a severe crop of acnitis (tuberculid of the face) to a papular syphilid is undoubtedly great (Fig. 12), and the scars of repeated attacks of erythema induratum with breakdown and ulceration may resemble those of a syphilid more closely than any other dermatologic lesion (Fig. 13). The response of tuberculids to arsphenamin (though they are resistant to mercury), the tonic non-specific effects of the drug in certain tuberculous patients, and its influence on tuberculous eye conditions, still further increase the possibilities of confusion. In therapeutic tests, arsphenamin must not be used. I have seen great social injury and discrimination, even divorce (Fig. 14), to say nothing of needless surgical interventions and medical misinterpretations, result from the deceptive influence of these various possibilities of error.

I would not have you feel that so cursory a review can cover the possibilities and fascinations of the tuberculosis and paratuberculosis of the skin. I have merely touched the surface of the subject in the hope that an occasional diagnostic "coup" which you may score by even a limited familiarity



Fig. 13 (Case A358132). The scarring of a tuberculid on the posterior aspects of the legs. Note the arciform scars with hyperpigmented borders suggesting those of a syphilid. There are, however, many individual scattered varioliform scars.



Fig. 14 (Case A171947). Papulonecrotic tuberculid of the feet and legs with the ulcers of erythema induratum. Note the scars of unnecessary surgical excisions and the resemblance of the normal scarring to that of a syphilid. This patient's husband endeavored to make her response to arsphenamin a cause for divorce on the ground that she had been treated for syphilis. Patients with tuberculids and no evidence of syphilis may occasionally give nonspecific partial positive blood Wassermann reactions.

with this most interesting group of dermatoses, may lead you to look further. I hope it will convince you, too, in the doing of it, that the dermatologist at his best should be not merely a mouther of hard names, with a specialty only half a centimeter deep, but an internist, whose major interest is that re-

markably efficient and highly complex organ or rather group of organs, the skin.

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ARGUMENTS AGAINST THE CONTINUANCE OF THE WAR TAX UNDER THE HARRISON NARCOTIC ACT

In protesting against the continuance of taxation under the Harrison Narcotic Act at the rate fixed by the Revenue Act of 1918 as a war measure, three dollars a year, it should be made clear that the medical profession is not protesting against the Harrison Narcotic Act itself, nor against such taxation under it as may be necessary to give the federal government jurisdiction. The Harrison Narcotic Act originally fixed a tax of one dollar a year, which was deemed sufficient to secure federal jurisdiction, and of that tax no complaint was ever made. Any tax in excess of the minimum amount necessary to give federal jurisdiction is essentially an occupation tax on the physician and as such represents a discrimination against the medical pro-

fession, since federal occupation taxes are not imposed on other professions. So far as this tax may be passed on by physicians to their patients, it is a tax on the sick and injured, falling on them because they are sick and injured. The tax collected under the Harrison Narcotic Act is paid into the general revenues of the United States, and does not go directly toward the enforcement of the act. The amount collected under this act from all sources is largely in excess of the amount expended for the enforcement of the act—in 1922, for instance, \$610,311.13 in excess of the amount expended during the same year. In any event, however, there is no reason for imposing on the medical profession any greater part of the cost for enforcing the law than is imposed on any other group in the community, for the law is enacted for the benefit of the community and not for the benefit of the medical profession.

—A. M. A. *Jour.*, Jan. 26, 1924.

TUBERCULOUS DISEASE OF BONES AND JOINTS.*

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The better understanding of tuberculous disease of bones and joints has well kept pace with our knowledge of tuberculosis as found elsewhere in the human body. The past decade has brought new aids not only in the pathology, diagnosis, and differential diagnosis, but especially in the wider dissemination of knowledge of treatment. Surgical principles brought forward by the late war have in a great measure in my opinion advanced especially the best conceptions of bone and joint surgical procedures both mechanical and operative.

We are universally agreed that tuberculous disease of a bone or joint is a secondary infection from some other source in the human anatomy, and that the tubercle is carried to the bone and joint structures by the blood stream. Most authorities agree that the tubercle begins its process of destruction only where blood vessels may lead, and may involve bone shaft, epiphysis or cartilage, and only secondarily from breaking down of some of these is the synovia of a joint involved. Pure synovial tuberculosis does not exist, as outside destruction must occur before synovia becomes infected.

The old question as to whether the infection in a bone or joint is of human type or bovine type is still unsettled. From observations of the various reactions in children and adults, I am of the opinion that in my experience children respond more frequently to the bovine reactions while in adults the reverse is true.

The tubercle bacillus when it becomes located in bone or cartilage destroys it, forming a granulation tissue of low vitality, but always with a slight tendency to heal by calcification, encapsulation or cicatrization.

It is well to remember the pathology of healing of a tuberculous focus in bones and joints because the principles of treatment, rest and protection, can only aid the primary tendencies of calcification, encapsulation and cicatrization. Tuberculous disease then in bones and joints is arrested depending

upon the strength of the primary tendencies, and the principles of methods now in vogue in treatment of these conditions are outside aids that tend to strengthen the already pathologic tendency.

Laboratory aids in the diagnosis of tuberculous conditions are many. The roentgen-ray findings are all-important not only as a diagnostic aid in bone and joint disease, but also in detecting evidence of tuberculous disease in other parts of the body, especially the lung and mediastinum. *Von Pirquet* reactions (bovine and human), we commonly find positive in apparently healthy children over four years of age, while children with gross and severe tuberculous lesions often fail to respond. *Manteau* intradermal reactions seem slightly more constant and of more value than the extradermal of *Von Pirquet*. *Wildbolz* autogenous urinary reaction (urine concentrated to one-tenth normal volume and injected intracutaneously) with absent nephritis and staphylococcemia has according to some authors been quite positive in cases of known tuberculosis. *D'Espine* sign in the diagnosis of bronchial gland tuberculosis in our experience has also been positive in a great number of children suffering with joint tuberculosis (again emphasizing secondary infection of bone). *Complement fixation* tests, according to various authors, in children over six years of age compare about the same as adults, about 80 per cent giving fixation reaction.

Tuberculosis seems prone to affect the weight bearing joints. The spine because of its multiple segments seems most frequent, hip and knee follow closely, the ankle and small bones of the foot being more frequently involved than the shoulder, elbow, wrist and digits. The shafts of bones are perhaps involved more frequently than we believed in the past, presenting usually a low grade infection with bone destruction, great proliferation of granulation tissue and sequestra of bone-sand variety.

It is impossible in a short symposium to describe in any detail various areas affected, and only brief general statements may be made. Certain characteristics, however, are noted in tuberculous bone and joint conditions that are well worth notice. Onset of tuberculosis, bone or joint, is an insidious, slow, gradual one, and slight pain gradually progressing is the absolute rule. Muscle spasm is present early, and as a result of muscle

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spasm atrophy comes early and is a constant sign in joint lesions. Slight deformity may be present early, but marked degrees depend somewhat upon the character of the part affected and the progress of destruction in bone, cartilage and surrounding tissue.

The principles of treatment of tuberculous joints are rest and protection and prevention of deformity. These measures are obtained through mechanical apparatus, surgical procedure, good hygiene and heliotherapy.

Pott's Disease.—In children absolute rest can be obtained by means of a Bradford gas-pipe frame; marked deformity is rare and deformity is improved when this apparatus is used until definite arrest is obtained. The ankylosing operations of Hibbs and Albee are of value in children over ten years and especially so in high dorsal and lower lumbar locations of the spine. In my opinion, in the future the ankylosing operations are going to be rarely used. Taylor braces, Calot plaster jackets, leather and celluloid corsets, are still used with absolute success in treatment of Pott's disease.

Hip Joint Disease.—Prevention of deformity is all-important. In children the Jones abduction splint with extension is extremely satisfactory. Ambulatory apparatus is quite essential in the older cases and is desirable in quiet cases in children. Surgical procedures to aid early ankylosis in the hip joint, especially in adults, are being advised by some authors. Sub-trochanteric osteotomy is universally used to overcome deformity in ankylosed cases.

Knee Joint Disease.—Perhaps the dictum of Sorrel can be taken in reference to the knee joint: in children, immobilize; in adults, resect; in the aged, amputate. Of course not every adult case should be resected. Amputation in the aged only shows our inability to stay the disease in the feeble. Deformity can be prevented by suitable apparatus and if present in ankylosed cases can be overcome by osteotomy or resection in many cases.

Ankle and Foot.—In the young, immobilization is still important. Arthrodesis or removal of bone affected, rarely in children and often in adults and the aged, may hasten the process of arrest.

Upper Extremities.—Not being weight bearing joints, surgical procedures are more frequently advised. In children, corrective apparatus and appliances should be given full trial before surgical

intervention is advised even when the disease is isolated to one small bone or joint.

Time Element.—The process of healing in tuberculous disease, like the onset, is slow and insidious. It requires six to eight months for the smallest bone or joint, and four to five years in the large bones or joints, even when uncomplicated. The rule of wearing supporting apparatus from six months to a year after all signs and symptoms have disappeared, is necessary and essential to procure arrest.

The Complications.—Deformities of various joints should be corrected and the parts placed in position to give the best function. Pott's paraplegia demands absolute rest and fixation preferably upon the Bradford frame. Paraplegia in children is not unfavorable because the granuloma about the cord usually absorbs with almost universal recovery. Paraplegia in adults is much more serious because the spinal cord in adults is usually surrounded by an abscess with an infiltration of white cells into the cord, and white degeneration of the cord occurs with permanent destruction and consequent paraplegia. Laminectomy in my experience has failed to relieve paraplegia, and fortunately is rarely used. *Abscesses* are not to be tampered with unless they become large and when uncomfortable because of size. In large cold abscesses aspiration is the rule, always endeavoring to keep the abscess closed. If an abscess should become secondarily infected it should be drained as any acute abscess. Pastes and antiseptic solutions in our experience are not to be compared with heliotherapy by sun and quartz lamps. *Sinuses* should be kept clean and secondary infection avoided as long as possible. Heliotherapy is our most valued agent in treatment of sinuses. *Amyloid degeneration*, the result of long continued suppuration, is a dangerous condition, but not necessarily fatal especially if suppuration can be stopped. In Minnesota we have seen after a summer's treatment with heliotherapy sinuses close and amyloid conditions disappear. *Meningitis* is a calamity which may be associated with tuberculosis at any time.

Differential Diagnosis.—In the differential diagnosis, tuberculosis should be confused only with pathological conditions that are slow in onset and very gradual in progress: chronic bone and joint lesions non-suppurative of the rheumatic type, chronic hypertrophic and atrophic; lues of bone or

joint; new growths; Von Perthes-Legg disease of the hip joint; bone abscess; chronic sprains; typhoid joints; joint abscess. The diagnosis of a tuberculous bone or joint condition is essentially the diagnosis of a chronic condition. A careful history, with intelligent interpretation of a roentgen-ray plate is of the greatest value. Laboratory aids, while of great value in the differential diagnosis, fail to be as convincing to me as the gradual insidious onset and characteristic bone atrophy, deformity and calcareous change seen in the usual radiogram of a tuberculous bone or joint. The positive diagnoses made in the laboratory are with the microscopical section and guinea pig peritoneal tests.

Heliotherapy can be used with considerable success even in Minnesota. The sun's rays beginning with two minutes' exposure in April is increased until the entire nude body is exposed to at least one hour's noon sun in mid-summer and fall; the quartz lamp is used in winter and on cloudy days. Apparatus should be used so the affected joint as well as the rest of the body can be exposed, sinuses and abscesses to receive close direct rays of the quartz lamp beginning with one-half minute exposure and the time lengthened to fifteen or twenty minutes or until signs of irritation appear. Heliotherapy is a most valuable adjunct in the hygienic treatment of tuberculosis. Good hygiene is essential. Sanitarium treatment is far superior to results obtained at home. Tuberculin in bone and joint cases is rarely used.

The old idea that an arrested tuberculous joint is a firmly ankylosed one is being superseded by a new idea that a tuberculous joint may be arrested without the disability of ankylosis. I believe this idea is coincident only with the much earlier diagnosis, earlier mechanical treatment and better hygienic and therapeutic measures now in vogue.

In conclusion we should remember the principle of treatment: rest, protection and good hygiene; treatment in children and young adults; resection of bones and joints of upper extremities in adults where a time element must be considered; fixation operations upon the spine only as an aid to outside immobilization and then after the age of seven and as operation of election; ever remembering that a tuberculous disease is cured by arrest and that the strength of arrest is coincident with the amount of calcification, encapsulation or cicatrization.

TUBERCULOSIS OF THE GENITO-URINARY TRACT*

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If it is recalled that tuberculosis of the genito-urinary tract embraces pathologic changes in eight complicated structures, many of which are bilateral, it will be realized how brief must be the reference here to even the most important of these changes.

INCIDENCE

The disease is most common between the ages of twenty and forty, but in any large series of cases approximately one-fourth of the patients will be more than forty. The incidence is twice as great in males as in females.

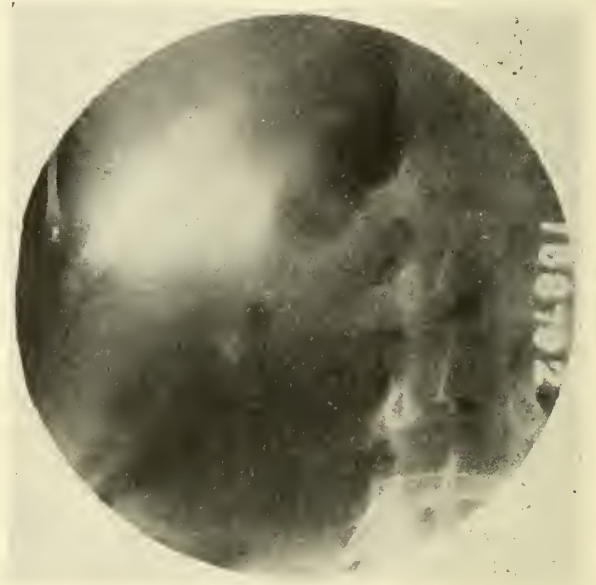


Fig. 1 (Case A158792). Areas of tuberculous calcification in an early case of renal tuberculosis.

SYMPTOMS

The usual symptoms of cystitis, frequency, dysuria and hematuria should always arouse a suspicion of tuberculosis. If these symptoms occur in early adult life, and do not readily respond to systematic treatment, the probability of tuberculous origin is greater.

In all cases of chronic cystitis a thorough urologic examination should be made, including the

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Fig. 2 (Case A422611). Areas of tuberculous calcification simulating renal calculi.

examination of the urinary sediment for the bacilli of tuberculosis. Why urinary sediments are not thus examined as frequently as sputum is hard to understand; the technic is similar, and the opportunity to make an early, exact diagnosis is equal. It is true that care must be taken not to confuse the smegma bacillus, which is also acid-fast, with the tuberculosis bacillus, but if care has been taken in obtaining the specimen of urine, such contamination will seldom occur.

Authorities now believe that genito-urinary tuberculosis is secondary to other foci. Therefore, if the bacilli are not found in the urine, evidence of tuberculosis in the skin, lungs, glands, or bone should be sought and, if found, considered as added evidence. If the result is negative, the genital tract should next be examined because it will be found involved in 70 per cent of patients with urinary tuberculosis. There is no uniformity of belief as to which of the genital organs is usually invaded first, but clinical findings indicate that the disease will be found in the majority of cases in all structures. Such general involvement results because the pathologic changes produce little or no pain, and an epididymis that has gradually become swollen and nodular does not often attract medical investigation until a discharging sinus has resulted. When the disease has reached this point, it is usual to find the prostate nodular, with multiple tubercles, and one or both seminal vesicles thickened and enlarged.

TREATMENT

There is considerable diversity of opinion as to the form of treatment which should be employed. Young and others advise removal of the entire seminal tract, including epididymis, vas, prostate and vesicles, basing this advice on the fact that in approximately 50 per cent of cases, the disease becomes bilateral if allowed to progress, and on the theory that it originates in the seminal vesicles and spreads to the prostate and epididymis. Others find that the removal of the epididymis will be followed by quiescence of the infection in the vesicles and prostate. This has been our experience at Rochester. If it does spread to the opposite epididymis, its later removal is not difficult, and in many cases will not be necessary. Care should be taken not to operate too soon after the onset of tuberculosis in the genital tract, for there is a greater chance that miliary or meningeal tuberculosis will result if operation is performed while the infection is sub-acute.

DIAGNOSIS AND SYMPTOMS

If a thickened epididymis, with or without a sinus, has been discovered in a patient with intractable cystitis, the diagnosis of urinary tuberculosis is highly probable. If the epididymes appear normal, a rectal examination may show an early stage of the disease in the shape of a nodular prostate or inflamed seminal vesicle. If the genital tract gives no clue, a careful roentgen-ray examina-



Fig. 3 (Case A312890). Area of tuberculous calcification in an advanced case of renal tuberculosis.

tion of the renal areas may be as instructive as that of the chest. Braasch and others have pointed out that, in 20 per cent of cases, the tuberculous areas in the kidneys early become the site of lime deposit, and multiple small shadows resembling those that would be cast by particles of sand give evidence of renal involvement. As the disease advances, the areas of calcification become larger, and may make the distinction between tuberculosis and stone formation difficult. However, the areas of calcification resulting from tuberculosis have a more irregular outline, and their density varies throughout, while that of a renal calculus is apt to be uniform. Still later in the disease, the greater portion of the kidney may become calcified, but at this stage the diagnosis is usually apparent.

In the female patient, a vaginal examination often yields as helpful corroborating data in a doubtful case as does rectal examination in the male, for during the course of the disease the ureter from a tuberculous kidney quickly becomes much thickened and tortuous, and can be readily palpated through the vagina. Such a finding not only helps to confirm the diagnosis of tuberculosis, but indicates on which side it exists.

Urinary tuberculosis probably always commences as a unilateral disease, and although the first symptoms arise from the bladder, the initial site is usually in the renal parenchyma, which is infected in the majority of cases through the blood stream. The areas of infection usually appear in the cortex, are at first few in number and possibly single. They occur most often at either pole of the kidney, are at first distinct, separated by healthy parenchyma, but as the disease progresses, coalesce. As the tubercle enlarges, more of the parenchyma becomes involved, and a considerable area of caseation results. When the process reaches the pelvis or calyx, it breaks through and destroys the normal contour of the walls, producing the characteristic irregular moth-eaten appearance in the pyelogram. So characteristic of tuberculosis is this deformity, that any pyelogram which shows either the upper or lower calices irregularly filled, with a tendency for the pyelographic medium to exude into the cortex, should at once call to mind the possibility of tuberculosis.

If, added to these findings, the ureter is much dilated and tortuous, the evidence is much stronger. If pyelonephritis can be excluded, the diagnosis is unusually certain. In pyelonephritis, the irregu-

larity of outline in the calices is not so sharp, and occurs throughout the pelvis and calices instead of being confined to a single area. Also, pyelonephritis is generally bilateral, while a tuberculous infection remains unilateral for a long period. However, it is seldom necessary to resort to pyelography to establish a diagnosis of tuberculosis, as other cystoscopic findings are so characteristic, chief among these being cystitis. This has an entirely different appearance at different stages of the disease, but at every stage it is usually quite characteristic. If the involvement of the bladder is of recent occurrence, the inflammation is usually localized on the same side as the involved kidney, its greatest severity being found in the proximity of the ureteral orifice. In such early cases multiple small tubercles, resembling small pearls, are scat-



Fig. 4 (Case A307536). Pyelogram of a tuberculous kidney showing cortical destruction, dilatation and tortuosity of the ureter.

tered over the inflamed area. They may appear singly or in groups, and immediately surrounding them, the mucosa has a redness of the greatest intensity. As the disease progresses, these tubercles break down and, by coalescing, form multiple shallow ulcers throughout the inflamed area, which are characterized by a small slough that usually floats freely from them, and by the intensity of the surrounding inflammation. The density of the color immediately surrounding the shallow ulcers is seldom seen in any other form of cystitis. On distention of the bladder, the affected areas bleed

easily, and the greatest pain is produced by even slight distention. Such an area of ulceration and injection may be localized to a single area, but it is usually not long until the entire viscus becomes



Fig. 5 (Case A303068). Cystogram of a tuberculous bladder showing reflux up the ureter.

involved. After long periods of such involvement the walls of the bladder become so cicatrized that they lose all power of contractility, and the bladder is converted into a tissue incapable of its normal contraction, and holding but a few ounces of urine. The cicatrization at times becomes so extensive as to involve the urethral sphincter and produce permanent incontinence; in the female this usually occurs late in the disease, while in the male the same process develops multiple soft strictures, which are encountered when an attempt is made to pass a sound or a cystoscope.

In a goodly number of cases, however, the ulcerations in the ureter, early in the disease, result in stricture that occludes the lumen entirely. This produces what has become known as auto-nephrectomy and probably includes the only cases of renal tuberculosis in which the patients recover, except by surgical treatment. If this occlusion of the ureter occurs early in the disease, a history is often elicited of more or less severe cystitis at some time in the past, from which the patient has recovered. In such cases cystoscopic findings will reveal a stricture of one ureter, which at first gives the impression of being due to a calculus, but since a

shadow cannot be detected in the roentgen ray, the axiom is remembered that "a stricture of the ureter that should be due to stone, but is not, should be due to tuberculosis." In such a case the opposite kidney will be found to hyperfunctionate, the spurts of urine appearing very frequently, and if a test of renal function is made by means of phenolsulphonephthalein, 20 or 25 per cent may be recovered in fifteen minutes instead of the usual 15 per cent.

The removal of tuberculous kidneys, when encysted, might not be indicated, were one certain that they would remain encysted, but the danger of an extension of the disease through the capsule to form a perinephritic abscess, and the possibility of its acting as a focus from which the remaining kidney may become involved, demands its removal except in patients well past middle life.

Once a diagnosis of renal tuberculosis is made and the adequacy of the opposite kidney established, nephrectomy is indicated, for unless this is performed, the disease in time will become bilateral. It is imperative that nephrectomy be performed early, in order to give the bladder an opportunity to heal before too extensive ulceration develops. Before surgery is undertaken, however, it is wise to warn the patient that the removal of



Fig. 6 (Case A192791). Typical areas of tuberculous calcification in a fairly advanced case of renal tuberculosis.

the diseased kidney will not at once remove the symptoms from which he sought relief; that the cystitis will be slow in healing, and that the max-

imal improvement cannot be expected in less than two years. If improvement is not deemed sufficiently rapid, good results are often obtained by

ing kidney, which it was impossible to detect at the time of operation. Braasch, in a previous review, found the mortality for the first five years to be 20

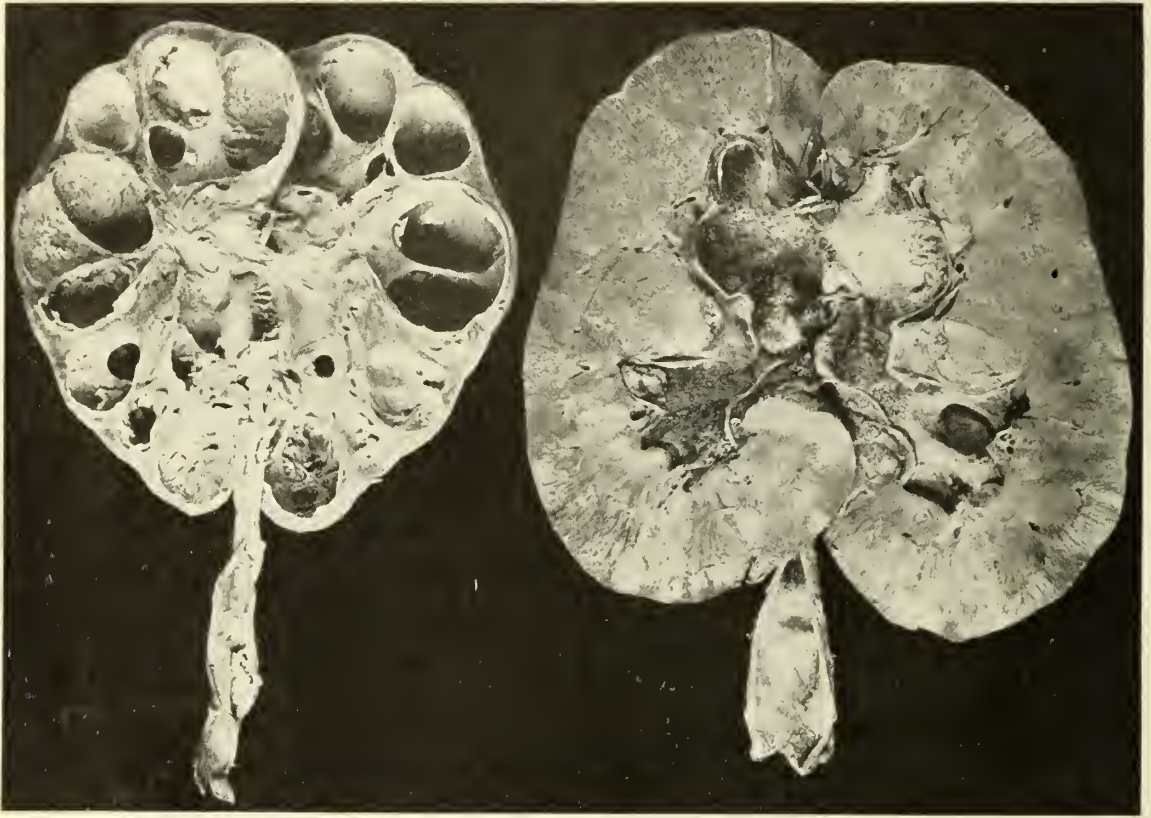


Fig. 7 (Case A419323). Kidneys from a patient with bilateral renal tuberculosis. Note compensatory hypertrophy of the less involved kidney and characteristic cortical destruction of the other.

the lavage of the bladder with increasing strengths of phenol solution up to 6 per cent.

The risk of surgical treatment is not greater than that of general surgery. Sixteen deaths resulted from 678 nephrectomies for tuberculosis performed at the Mayo Clinic between 1894 and 1923, inclusive, a mortality of 2.3 per cent. Braasch and Scholl, in a recent investigation of the late mortality in cases of nephrectomy, found that more than half the deaths (13 per cent) occur during the first year, probably owing to disease in the remain-

per cent. The prognosis for recovery would, therefore, be 80 per cent, surely a gratifying result in so serious a disease.

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GASTRO-INTESTINAL MANIFESTATIONS OF TUBERCULOSIS*

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In our conception of tuberculosis we keep in mind the fact that any manifestation of this disease in any tissue of the body other than the lung is, in the vast majority of cases in adults, coexistent with demonstrable pulmonary involvement or secondary to it. However, we may properly discuss gastro-intestinal manifestations in a symposium on non-pulmonary disease because:

1. In a certain percentage of these cases, either the pulmonary lesion is negligible as being inactive or is not clinically demonstrable.

2. Recent developments in diagnostic methods and in treatment have focussed attention upon these complications.

In the inception of tuberculous disease, when the bacilli and their products are beginning the contest with the natural resistant forces of the body, these forces are of the protective type and are reinforced more by the weapons of medicine than of surgery; but later on, as the natural defences fail, surgical intervention may come in and by physical and mechanical means remove those tissues that have been beaten in the contest and whose existence may be a menace to other vital parts. Thus has surgery for many years been winning the battle, especially in the chronic hyperplastic types of tuberculous enterocolitis.

During the past ten or twelve years, however, because of the development of roentgen examination and an improved treatment, there has been dawning a new era in our conception of the seriousness of tuberculosis of the gastro-intestinal tract. We now contemplate these conditions in a much more hopeful and courageous frame of mind than formerly obtained.

Incidence.—Some observers have found intestinal tuberculosis to be primary in from 3 to 5 per cent of all cases in adults; while in children it is primary in from 30 to 50 per cent and in the latter group the infection is usually of bovine origin. Lemon,⁷ in a recent presentation of fifty cases of tuberculous enterocolitis, finds in 14 per cent no primary focus in the lungs. He suggests that this

high percentage of primary intestinal disease in adults may be due to the fact that these patients come from a country where examination of animals for tuberculosis is a practice of recent development. It is generally considered, however, that even when the intestinal manifestation is the dominating feature, it is secondary to a tuberculous lesion elsewhere, in lung or gland tissues.

Tuberculous lesions of the mouth, pharynx and esophagus are very rare and seldom if ever primary. Actual tuberculous lesions of the stomach are also extremely rare, ulceration, the most common form, occurring but twice in 2,000 autopsies reported by Fenwick. The gastric lesions are found as miliary nodules or as single or multiple ulcers.

Tuberculous ulceration of the intestines has been found by ordinary methods of diagnosis to be exceedingly rare in early pulmonary disease. Schwatt and Steinbach¹¹ found, in 2,000 early pulmonary cases, a diagnosis of tuberculous enterocolitis was made clinically in only sixteen cases, or .8 per cent. In 135 advanced cases the diagnosis was made in thirteen cases, or almost 10 per cent. In 117 cases coming to autopsy they found forty cases, or 30 per cent. Other observers find 60 to 90 per cent of all pulmonary cases coming to autopsy showing intestinal lesions. Brown and Sampson,³ by roentgenological examination of the intestinal tract in pulmonary tuberculosis, give a much higher percentage of intestinal involvement than is diagnosed by ordinary clinical means.

Location of Lesions.—The lower portion of the ileum, the cecum and the appendix are most frequently involved, disease occurring here in about 85 per cent of all cases of intestinal tuberculosis (Conrath). However, tuberculous appendicitis exists as a disease peculiar and distinctive in itself in a small percentage of cases. It has been estimated that from 1 to 2 per cent of all appendices at operation are tuberculous. Margaret Warwick¹⁴ found at the University of Minnesota in post-operative examination of 210 appendices, approximately 1 per cent tuberculous. She emphasizes the wisdom of sectioning and examining carefully all appendices on removal, as demonstration of the tuberculous nature of the disease in the removed tissue may point the way to an early diagnosis of tuberculosis elsewhere in the body, with consequent early treatment.

Classification.—Tuberculosis of the intestines is conveniently classified in four groups:

*Presented in symposium before the annual meeting of the Minnesota State Medical Association, St. Paul, October 10, 1923.

1. Chronic hyperplastic tuberculosis which constitutes about 85 per cent of all intestinal tuberculosis in adults. It may be found in the terminal ileum, the flexures of the colon and in the rectum, but most commonly occurs in the cecum.

2. The ulcerative type, the common tuberculous enteritis occurring in children and as a secondary lesion in adults with advanced pulmonary disease.

3. The stenotic or cicatricial type which occurs usually in the small intestine.

4. The entero-peritoneal type which favors the ileo-cecal region, involving adjacent lymph nodes and peritoneum. In this form there is ulceration as well as hyperplasia of the bowel wall.

Symptoms and Diagnosis.—Disturbance of the gastro-intestinal function is very common in pulmonary tuberculosis. The question of diagnosis of intestinal involvement must be decided upon a general survey of the whole history and symptoms, more than upon one particular feature. Failing appetite, constipation, flatulence, feeling of discomfort in the stomach after eating are commonly present in patients who are developing intestinal disease. The leading symptom suggesting intestinal involvement is pain felt in the mid or lower abdomen, intermittent in character, suggesting gas pains, aggravated by food, relieved by fasting and persisting from day to day. Diarrhea may be persistent or may alternate with constipation. Pottinger⁹ mentions, as a suspicious symptom, the occurrence of stools only at night, due to changes in motility. The presence of diarrhea may be misleading, due to errors in diet causing intestinal catarrh. The finding of bacilli in the stools is of no diagnostic value, except in the absence of open pulmonary lesions. Whether a study of the symptomatology will determine what part of the bowel is affected and to what extent, there is some doubt.

In his series of 50 cases Lemon did not find that the symptoms indicated the location or extent of the lesions. Archibald,¹ by combining symptoms with findings by palpation, was able to formulate the following scheme of diagnosis:

"1. When the small bowel alone is involved, there is present constipation, often quite marked, and there is no thickening or mass, and in particular no tenderness to palpation localized in the cecal region.

"2. When the cecum, with or without the ascending colon, is involved, and the small bowel is free, there is present diarrhea or alternating constipa-

tion and diarrhea, and there is always to be felt a fairly defined thickening, sometimes even a mass, and there is a tenderness to palpation in the cecal region.

"3. When both small bowel and cecum are involved there is a mixture of the above signs and symptoms.

"4. When the transverse and descending colons are diseased in addition there are very rarely any signs that point to it; these are comparatively silent regions.

"5. When the appendix alone is tuberculous, it is not possible before operation to exclude the possibility of disease of the cecum. Between simple appendicitis and tuberculous disease it is often difficult to make a diagnosis; but it may be said that, where definite thickening of the tissues in the appendix region is felt, without there being an acute inflammatory reaction, and with a history of chronic slight pain and of occasional subacute attacks with persisting soreness, then the condition is much more suspicious of tuberculosis of the appendix, and possibly also of the cecum, than of simple appendicitis."

The roentgen diagnosis of ileo-cecal tuberculosis was first brought to notice by Stierlin¹³ in 1911. He stated that "the early as well as the later stages of the so-called cecal tuberculosis, can be diagnosed by this means, even in cases undiagnosable by the ordinary clinical methods." Other observers, notably Case,⁶ Pirie,⁸ Brown and Sampson,³ and Carman,⁵ verify this statement and present statistical evidence to show the inestimable value of a roentgen examination of the intestinal tract in all cases of pulmonary tuberculosis. Brown, Sampson and Hayes⁴ in 1922 report the results of their study based on 1,036 cases. "Hypermotility, localized or general, and filling defects were not the most significant findings," and they conclude that these data "indicate only ulceration of the colon which, when it occurs in a patient with pulmonary tuberculosis, is practically always tuberculous in nature. Persistent and recurring segmentation and dilation of certain loops of the small bowel are very suggestive of a similar lesion in this location."

With the aid of these roentgenological studies in diagnosis, treatment of these complications with or without surgical intervention, may be employed much earlier in the disease and with consequent happier results than formerly were obtained.

Treatment.—Tuberculous ulceration of the intes-

tine in the early stage is generally considered to be the problem of the physician. Healing may occur under the ordinary hygienic dietetic treatment in the sanatorium. While the chronic hyperplastic type offers greatest relief by surgical means, in the ulcerative variety, when it has failed to improve after a reasonable length of time under proper care and medication, and the pulmonary process is not so active as to contraindicate surgical procedure, great relief of symptoms may follow operation and permanent results are obtained in an encouraging number. Surgery is emphatically indicated when there are palpable masses in the ileocecal region associated with signs of chronic intestinal obstruction or when ulceration has gone on to cicatrization with stenosis of the intestinal lumen.

Surgeons report varying results depending obviously upon the extent and activity of the pulmonary disease and the location and extent of the intestinal complication. In Archibald's series of thirty-four cases of all types, the great relief from distressing symptoms in patients who would otherwise continue to suffer and the percentage of permanent results would encourage us to look upon this procedure with favor.

Ringer and Minor¹⁰ report thirty cases of intestinal tuberculosis treated by intravenous injections of calcium chloride with marked relief of symptoms in some cases. The authors believe this treatment prolongs life in some individuals and even may possibly cure the intestinal disease if diagnosis is made early. Other observers have noted similar results. Heliotherapy is of undoubted value in the treatment of intestinal tuberculosis. Dr. Bendes, of wide experience in the employment of this method of treatment, will discuss this therapy. However, at the risk of repetition I wish to emphasize the efficacy of artificial sunlight (the quartz lamp) in the treatment of these cases. In 1921 Blanchet² of Saranac reported twenty-five cases in which intestinal disease was diagnosed clinically and intestinal irritability demonstrated by the roentgen ray. Of these twenty-five cases, 40 per cent lost all symptoms and showed negative pictures with the roentgen ray after treatment. Stewart¹² reports seventy-seven cases treated by the quartz lamp, with improvement in 66 per cent. The experience of other clinicians is varied. The writer has used the ultra-violet ray in a considerable number of cases with encouraging results.

Although we cannot frequently check up our diagnoses by post-mortem examination—which fact is perhaps the best evidence of the efficacy of the treatment—the present-day clinical and roentgenological methods of diagnosis are sufficiently accurate upon which to base the claim of beneficial results obtained by this therapy.

CONCLUSION

1. Intestinal tuberculosis may occur in the absence of a demonstrable pulmonary lesion, but is usually a complication of disease in the lung.

2. Healing may take place under medical treatment.

3. Roentgenological examination of the gastro-intestinal tract should be made in all cases of pulmonary tuberculosis.

4. Surgical intervention greatly relieves distressing symptoms and may produce permanent results.

5. A careful examination of all appendices removed by operation would reveal tuberculosis in at least one per cent of all cases. Any means of diagnosing this disease should not be overlooked.

6. Improved diagnostic methods and favorable results from treatment by natural sunlight and quartz lamp therapy greatly augment our hope and courage in the treatment of this serious condition.

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HELIO THERAPY IN THE TREATMENT OF TUBERCULOSIS*

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Heliotherapy is that branch of medical science which treats of the application of the sun as a remedy in the treatment of disease. Locally its application is characterized at first by a feeling of warmth, then a slight erythema, followed by a chronic congestion and finally a pigmentation.

The idea of modern heliotherapy was conceived by Rollier. In 1903, he opened a clinic in Switzerland and formulated a technique, which has stood the test for twenty years. There have been as many deviations and improvements in his technique as there are heliotherapy workers in Europe and America. Every man who starts a clinic for heliotherapy thinks he should improve on Rollier's technique and have a little private one of his own. Rollier's technique has been used for twenty years and after following it almost ten years, I, personally, cannot see why one should deviate from it. In fact, it should be adhered to more closely. Heliotherapy does not mean turning a patient out into the sun indiscriminately; it means giving carefully supervised sun baths.

The great obstacle in treating extra or non-pulmonary tuberculosis is that this type of tuberculosis is looked upon as a local disease, and is referred to the surgeon or orthopedist, and the fact that it is a general constitutional disease with local manifestations is entirely ignored.

The technique of heliotherapy is as follows:

Rollier started out by zoning the body, as feet, legs, thighs, abdomen and chest, giving each zone its therapeutic dose of sun.

On the first day, insolate (expose to the sun) the front of the feet as far as the ankles for five minutes; at the end of five minutes, roll over and expose the back part of the feet the same way for five minutes. Then cover up and rest one hour. At the end of one hour, repeat the insolation and at the end of this second exposure, the sun bath is finished for the morning of the first day. That afternoon, repeat the insolation the same way as in the morning.

On the second day, expose the anterior part of the feet as far as the ankles for five minutes. At the end of five minutes, carry the exposure up on the legs as far as the knees for another five minutes. At the end of ten minutes, roll over and insolate the back part of the feet and legs in the like manner. Two exposures in the morning and two exposures in the afternoon at one hour intervals.

On the third day, insolate the anterior part of the feet for five minutes. At the end of five minutes, carry the insolation up on the legs as far as the knees for another five minutes and at the end of ten minutes carry the insolation up on the thighs for five minutes. At the end of fifteen minutes, roll over and insolate the back part of the body in a like manner. Give two insulations in the morning and two insulations in the afternoon at one hour intervals.

On the fourth day, insolate the anterior part of the feet for five minutes; at the end of five minutes, carry the insolation up on the legs for five minutes. At the end of ten minutes, carry the insolation up on the thighs for five minutes; at the end of fifteen minutes, carry the insolation up on the abdomen. At the end of twenty minutes, roll over and insolate the back part of the body in a like manner. Do this insolation twice, once in the morning and repeat the insolation in the afternoon.

On the fifth day, insolate the anterior part of the feet for five minutes; at the end of five minutes, carry the insolation up on the legs for five minutes; at the end of ten minutes, carry the insolation up on the thighs for five minutes; at the end of fifteen minutes, carry the insolation up on the abdomen for five minutes; at the end of twenty minutes, carry the insolation up on the chest for five minutes; at the end of twenty-five minutes, roll over and expose the back part of the body in a like manner. This insolation is carried out once in the morning and once in the afternoon.

On the sixth day, repeat all the insulations as on the previous days, but increase the chest insolation to ten minutes both front and back.

On the seventh day, do all the previous insulations, but give the chest fifteen minutes both front and back.

Each day, increase the insolation by successive five minute steps until the fourteenth day.

On the fourteenth day expose the whole body for fifty minutes; on the fifteenth day for fifty-five minutes; on the sixteenth day for sixty minutes;

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on the seventeenth day for sixty-five minutes; on the eighteenth day for seventy minutes; on the nineteenth day for seventy-five minutes; on the twentieth day for eighty minutes; on the twenty-first day for eighty-five minutes; on the twenty-second day for ninety minutes.

Now, though we find that by this graduation we are able to give three hours of sun at one time, and in some cases even four and five hours, still we do not advocate giving that in all cases, but only in cases where the tolerance is found to be great enough. After a pigmentation has taken place, large doses of sun can be given without deleterious effects.

The usual treatment is three hours of sun at one and one-half hour periods, especially, in high typed blonds, red-haired persons, the emaciated, the children and the aged.

On the fourteenth day, total exposure. The treatment is divided into two periods of ninety minutes each, forty-five minutes on the back and forty-five minutes on the anterior part of the body. Two such treatments are carried out daily, one treatment in the morning and one treatment in the afternoon. When the patient is able to withstand this amount of sun without any unpleasant effects and when his general condition starts to improve, more sun can be given up to four and five hours.

Some patients react more favorably to frequent short exposures instead of too long exposures, especially those who are inclined to burn. In the latter cases, the pigmentation will take place more rapidly, if four one-hour exposures are indulged in instead of two two-hour exposures.

An ice cap to the nape of the neck and a cold compress over the heart alleviates symptoms in cases who become fatigued easily and who suffer from exhaustion and palpation.

The technique used at Glen Lake Sanatorium is the same as the one followed by Rollier, with this exception: Dr. Rollier allows his patients to rest for a period of from fifteen to twenty minutes between exposures, but we have found that in most cases this is too short a time. If the patients have not had sufficient rest they become exhausted. Twenty minutes of rest between exposures should be the minimum time. A longer period is much better. When a patient starts routine sun cure we have him rest for an hour between exposures. He should not be tired after a treatment, but should feel invigorated. If patients are tired after a sun

bath, they have been exposed too long a period or they are not reacting favorably to the treatment.

Some of the accidents of faulty technique are: headache, nausea, vomiting and fatigue. Here I might mention that the sun rays will cause fatigue just as voluntary exercise does, if indulged in indiscriminately. The safest method is graduating the patients as we do.

Different individuals react differently to the sun. All patients cannot abide strictly by the routine treatment as it is prescribed by the physician. The susceptibility of the individual must be taken into

Days	Feet	Legs	Thighs	Chest	Abdomen
1	5				
2	10	5			
3	15	10	5		
4	20	15	10	5	
5	25	20	15	10	5
6	30	25	20	15	10
7	35	30	25	20	15
8	40	35	30	25	20
9	45	40	35	30	25
10	50	45	40	35	30
11	55	50	45	40	35
12	60	55	50	45	40
13	65	60	55	50	45
14	70	65	60	55	50
15	Total	.....	.....	.....	55
16	Total	.....	.....	.....	60
17	Total	.....	.....	.....	65
18	Total	.....	.....	.....	70
19	Total	.....	.....	.....	75
20	Total	.....	.....	.....	80
21	Total	.....	.....	.....	85
22	Total	.....	.....	.....	90

consideration. Some patients can stand a faster graduation than the one prescribed, but there are others who cannot tolerate it, especially the blonds, the red haired, the emaciated and the febrile cases of pulmonary tuberculosis. In these cases, the progress is even slower. We generally start them on periods of exposure of two minutes on each zone, but we have had cases where even two minutes of exposure has proven too much.

The exceptional cases, as mentioned before, should be watched constantly so that they do not

burn. At the first sign of redness the patient should be covered and taken out of the sun. In case a burn follows, it is accompanied by a sense of burning, itching and smarting, and in some cases the patient will run a high temperature and pulse. Generally this condition lasts for about three or four days and then disappears. The patient is then kept out of the sun until all signs of a burn have disappeared and his temperature and pulse have returned to what it was before the accident occurred. A temperature resulting from a burn is contra-indicated for sun cure. When the patient is again started on his treatments, he should be started a few steps back from the time when sun baths were discontinued. As I said before, these cases should be watched constantly so that they will not burn, because if they do, the progress of the treatment is interrupted and much valuable time is lost.

When Rollier instituted heliotherapy it was for the purpose of curing surgical tuberculosis. Since then it has been used and advocated as an adjunct in the treatment of metabolic disease and some individuals even go so far as to prescribe heliotherapy when they have exhausted all other ethical, medical and surgical skill at their command.

After cases of surgical tuberculosis have passed through the operative and plaster paris stage and find their way into the Sanatorium, they usually have a pulmonary lesion complicating the surgical one and also in many cases there are abscess formations and draining sinuses due to secondary infection.

It is because of these cases of surgical tuberculosis complicated by pulmonary tuberculosis in all stages of the disease including some with cavity formation that we are varying just this much from Rollier's technique.

We take temperature and pulse because those two factors are the "stop, look and listen" sign post of activity and also of excessive sun. This is done as follows:

Temperature and pulse are taken immediately after the sun baths and again one-half hour after the sun bath, while the patient is resting. If there is one degree elevation in temperature or a marked increase in pulse rate after the half hour rest, it means that the patient is getting too much sun and the treatment is dropped back a step or two to the point where the patient reacted favorably. The procedure is carried out as long as a patient is on

sun. We know that this is important and the observation should begin as soon as the patient starts sun cure.

If a patient gets a headache, becomes dizzy or becomes nauseated while taking sun, the sun bath should be discontinued immediately and the patient kept in his room or in the shade until he has been relieved. If he remains in the sun in spite of these symptoms, there will be a gastro-intestinal disturbance lasting from a few days to even possibly a week.

The initial sun bath is not taken until the patient has become acclimatized. Generally this takes about two weeks. During this time the patient is studied, the range of temperature and pulse is watched, the heart and lung condition is studied, blood and urine conditions noted. Wassermann and other tests are made. During this time, the patient becomes accustomed to the light and air, and has also learned through observations and instructions some idea of how the treatment is carried out and what is expected of him.

Before a patient starts his daily treatment he takes his temperature and pulse. Immediately after the sun bath he again takes his temperature and pulse, and then again, one-half hour later. So if an acute condition occurs we can tell just which sun exposure was the cause.

One of the principal factors to be taken into consideration in giving heliotherapy is the source of the sun. Early morning sun is desirable and it is best to avoid the hottest time of the day and the direct rays of the sun. White linen should be used as a covering on the bed because it intensifies the sun's rays.

Certain precautions should be taken while the patient is taking the sun bath. The head, especially the nape of the neck, should be protected from the sun's rays. This can be done by means of an awning, a wide-brimmed hat, or a sunbonnet. These precautions should be carried out except in special cases when the patient is instructed to expose his face to the sun. Even then, when exposing posteriorly, he should cover the nape of his neck. We have made several attempts to dispense with the ice cap or wet cloth at the nape of the neck and over the heart. This can be done in the majority of cases but there are some cases where it is still absolutely necessary.

The patients should always wear dark glasses, black being the best. If they do not they may con-

tract conjunctivitis. They should also be protected from the wind at all times.

When starting the sun baths it is necessary to go slowly. The time is gradually increased until a pigmentation has been obtained resulting in a mahogany brown. Then the exposures can proceed more rapidly and longer periods to the sun can be given, even as much as four or five hours at a time.

The reason for this method is described by Rollier as "By this means we are able to get a general idea of the tolerance of the patient to sunlight before the more vulnerable parts of the body are exposed; any accidents which result are therefore of a slight nature, and as they only affect outlying regions of the body, their general effects are likely to be minimal. The thoracic and abdominal viscera are not subjected to any congestion but rather to a decongestive action, as insolation of the extremities causes the blood to flow to these regions and therefore away from the viscera."

In the various locations of the disease, orthopedic position is maintained by means of pillows, boards and extension apparatus. No casts are used.

During the course of pigmentation various things happen. All patients do not respond in the same manner. The sequences of occurrences that take place are numerous.

I will endeavor to explain to you just what takes place when a patient is first exposed to the sun. I will begin with the action of the sun upon the skin, and then follow with the action of the sun upon the individual.

The action of the sunlight upon the skin is in proportion to the length of time and the intensity of the light. At first, there is a dilatation of the superficial capillaries in the skin. This produces an erythema which gradually shades into a bronze hue, then turns to a copper color and finally turns into a chocolate brown.

During the first five or seven days of treatment the first noticeable perception is a branny desquamation of the skin, which brushes off like dandruff. This desquamation is nothing more than dead skin. After that the various steps in the pigmentation follow.

During this erythematous stage there may be an itching of the skin, which varies from a very slight itch to a painful affair coming on in from six to thirty-six hours. This itching usually clears up by another exposure to the sun. Aside from being an

unpleasant symptom, there is no danger associated with it. If a temperature and fast pulse occur along with the itch, you can be sure the patient has been burnt and the burn will manifest itself on the second day with exfoliation of the skin.

The rôle of pigmentation is protective. It is a protection against burns and infection and against the irritating ultra-violet rays and it enables the body to withstand large doses of sun without any bad effects to the patient.

At first the skin is very white, and sickly looking. It is cold and clammy to the touch and resembles putty. When the pathologist attempts to obtain a drop of blood for a blood count he does so with difficulty. He must make a deep puncture in order to obtain sufficient blood for an analysis. After a few treatments the skin becomes warm and glossy, and finally becomes soft and velvety, bleeds easily and heals very rapidly. Infection and bed sores are unknown to sun patients. In some cases, edema of the part will occur. In others, there will be the formation of minute vesicles filled with a clear fluid, especially on bright days when a hot wind is blowing. These are just a few of the things that occur during the course of the tanning. In some cases, they do not call for special treatment; in others they do.

According to Kisch, after pigmentation takes place, there is seven times more blood in the skin than there was before starting sun treatments.

Under the influence of the sun, hemoglobin is increased, the sweat glands are stimulated and the organs of internal secretion are accentuated.

As for burns, I have taken the Thézac Porsmeur lens and focused it upon pigmented skin. After fifteen minutes, there was an erythema on the pigmented skin which disappeared in about one hour, while upon unpigmented skin a burn took place with blistering which lasted for several days.

When a patient first starts sun cure there is generally a loss of weight. This is due to poor appetite, a loss of water from the stimulated sweat glands and kidneys, and the general cachectic state. After the tenth day, the body becomes accustomed to the action of the light and air. The patient's appetite returns, and the weight that was lost in the first ten days is rapidly regained, usually in the same length of time in which it was lost.

In giving heliotherapy to surgical cases, we do not use casts or splints, but immobilization is obtained by means of traction and extensions. If

casts and splints were used the part of the body affected would be covered and no benefit would be derived from the sun, light and air. It is necessary that every part of the body be exposed to the sun if the patient is to receive any benefit. When a surgical case who is in traction is put out on the porch for sun, all apparatuses are removed, so that every part of his body will be exposed. When casts or splints are used, the muscles and tissue of the part encased in a cast will atrophy; on the other hand, when a patient is put in traction, the traction is removed once a day, and the patient's limbs or whatever part of the body is in traction, is massaged, so the muscles will not atrophy. In cast or splint cases an ankylosis generally takes place. In heliotherapy, we strive to obtain a cure with restoration of function.

Patients are allowed to drink all the water they care to while taking the sun bath. As yet, no harmful results have been noticed. As for food, we give our patients their breakfast while they are taking their sun baths. Last summer we tried giving them their dinners while in the sun and we did not have one gastric upset. So far, this year none of the children or women have experienced any intestinal disturbances. They have all had four hours or more of sun daily and have had both their breakfasts and dinners while taking the sun bath. Among the men, we have had a couple of complaints of nausea, I believe, due to eating while in the sun. These patients lay the disturbance to some other cause than the sun, but personally I believe the sun was the causative agent.

Recently my attention was called to the danger of sterility in those patients taking heliotherapy, especially in case of genito-urinary tuberculosis. This idea is erroneous. A loin cloth (not a bathing suit) is worn only as a matter of decency and not to prevent sterility. If sterility occurs it is due to some underlying pathological condition and not to the sun's rays. What better evidence have we than the Indian? One of the differences between a white man and an Indian is that the white man is face from his neck up while an Indian is all face.

Air and altitude do not play an important rôle in heliotherapy. The main principle in the treatment is simply to use the sun whenever it shines. A great many false impressions are formed by casual observers when they learn that children take heliotherapy during the winter. There is

nothing remarkable about this and false impressions should not be formed. In the first place, all the children during the winter have heavy overcoats of tan. They have lived in the open, their skin has been accustomed to the light and the air and when the thermometer drops to around freezing, those children who have had heliotherapy do not mind it. Secondly, the patients are not exposed in the winter unless the sun is shining, the day is not too cold, and there is no wind blowing. If a patient complains of being cold, he is immediately covered up.

A few facts to remember are:

1. Sunshine without rest is worthless.
2. Sun cannot be taken through glass or screen.
3. Patients cannot come to your office for artificial sunshine and expect to get well.
4. The mother, aunt, or sister cannot supervise the taking of sun any more than they can supervise the routine sanatorium care for pulmonary tuberculosis.
5. It takes trained workers to supervise heliotherapy.
6. In cases of bones and joints it does not mean operation, but it means applying orthopedic and surgical sense to heliotherapy.
7. Cancer and syphilis will not get well with sun treatment.
8. Remember that rest is just as important as sun.
9. The time of day, the season of the year, the character of the patient, and the amount of pulmonary tuberculosis must be taken into consideration.
10. No tan, no cure. The greater the tan the sooner and better the cure.
11. Sun cure does not cure all cases of surgical tuberculosis and a certain percentage fall by the wayside.
12. Hemorrhagic cases must be watched carefully and the time periods are cut to two-minute exposures instead of five-minute.
13. Genito-urinary tuberculosis cases are given tuberculin along with sun. We use Koch's O. T. and give it according to Pope's logarithmical scales.

In all cases of extra- or non-pulmonary tuberculosis, remember the following: If you are loath to dispense with casts, bivalve and remove

them during sun cure. Do not cover a hip with a cast and expect to give sun cure through it.

If you think you must operate, hesitate, give heliotherapy its opportunity first. Then you will operate only in very exceptional cases.

DISCUSSION ON THE FIVE PRECEDING PAPERS

DR. W. S. LEMON, Rochester: A symposium of this character cannot fail to impress one with the far flung attack of the bacillus of tuberculosis. It is true that the organism affects certain tissues more frequently than others, as evidenced by the preponderating incidence in the lungs, yet few tissues are exempt. The symptoms are the expression of a reaction of the tissue involved and represent the physiologic possibilities of that structure. It is not strange, therefore, that the evidences of activity vary and indeed are as different as are the reaction possibilities in the skin from those in the bowel, or those of the genito-urinary apparatus from those of bone.

It must be granted, of course, that the diagnosis has been proved by physical and laboratory examination, or by the use of tuberculin, or by histologic investigation of infected tissue. The first method is best designed to determine whether or not activity is present, because symptoms resulting from activity are a better guide to the diagnosis of an active lesion than are the physical signs or often the laboratory tests. In fact, constitutional symptoms may appear days or weeks even before recognizable anatomic changes have taken place.

The fundamental functions of the body are affected in much the same way regardless of the location of the lesion. Thus in a study of tuberculous enterocolitis, I found that the pulse rate, blood pressure and weight of patients were about equally affected, regardless of the location of the lesion in the bowel, or whether the lungs or other organs were likewise invaded by the bacillus of tuberculosis.

Tuberculosis is first of all a focal disease. The reaction to the bacillus produces an avascular cellular morbid structure lying within the tissue, and whether within lung, skin, kidney, bone or bowel, separated from it by a protecting layer of greater or less permeability, depending upon the degree of success of the protective mechanism of the particular individual infected.

One other factor of importance is connected with the possibilities of constitutional symptoms, namely, the activity of the enveloping structures. In this regard, Krause says: "It would seem that the intoxication of tuberculosis, in the natural evolution of the infection, is in large measure a nonspecific process brought about by the absorption of material from foci in amounts large enough to produce symptoms."

It is possible that the bacteria themselves or their degraded forms, or the products of the cellular material forming a focus, may produce intoxication and constitutional symptoms if the surrounding structures are in a physiologic state to favor absorption through vessel or lymph channel. Given an open vessel, a lymph channel or other channel of communication and bacilli may spread from a primary focus to other organs of the body. Im-

mediately, the tissues being hypersensitive, there is an outpouring of inflammatory elements, and acute reinfection is clinically diagnosed from the constitutional symptoms due to their absorption.

Thus the patient with pulmonary disease progresses badly in spite of good treatment when the kidney becomes involved from hematogenous infection, or equally badly when the bowel is involved, probably from the ingestion of germ bearing sputum. The later symptoms expressing the location of this process depend upon the interference with the physiological activities of the area damaged. In the skin these are expressed often as signs rather than symptoms and may be evidence of true histologic tuberculosis as in lupus vulgaris or as a localized nonspecific inflammatory reaction, as in the tuberculids. These latter may be compared to a tuberculin reaction, which is primarily an immune reaction associated with an acute focal inflammation. Stokes says: "They are cutaneous reactions to hematogenously distributed tubercle bacilli deposited in a hypersensitive skin and originating in a tuberculous lesion sometimes unrecognized."

I am confining my remarks entirely to a general consideration of tuberculosis rather than to its attack upon the various organs. Underlying all is a fundamental fact that we are dealing with tuberculosis itself, that the symptoms described are but the reaction of the tissue attacked, and are as varied as are the physiological functions of the several organs.

Dr. Bendes was good enough to let me have his paper before coming to this meeting and I wish I could add anything to it. It seems to me that he has described in detail in such a thorough way that anything that I might say would be superfluous. Anyone who is acquainted with the Rollier type of management and with the character of the Rollier treatment must know that he put into our hands a very useful weapon in the control of tuberculosis.

I have attempted to open this discussion by the mere use of generalities which will cover the diverse forms presented in the papers of the symposium. I wish to leave to the members of this society the privilege and the right to discuss the particular form that claims their interest.

DR. M. GEORGE MILAN, Thief River Falls: I desire to make a few remarks on the subject of non-pulmonary tuberculosis, particularly with reference to the paper presented by Doctor Marcle on gastro-intestinal manifestations of the disease. I imagine that Doctor Marcle did not have time to include in his paper points relative to diet in the care and treatment of these manifestations. I, myself, have come to the conclusion after six or eight years' observation in sanatorium work of cases wherein a gastro-intestinal complication accompanies pulmonary tuberculosis that we can do as much with diet in many of these cases as we can accomplish with any other single method.

The procedure in treatment to be followed from the dietary standpoint depends mainly upon two factors: first, attempts must be made to lessen irritation in the intestinal tract; and, secondly, we must bring into play any method by which peristalsis can be decreased and maintained at a level coincident with a normal functioning of the intestinal tract itself. Success in the handling of this

second factor will be dependent to a great extent upon our efforts in lessening local irritation. I have found that many patients when given milk in excessive amounts will develop indigestible curds in the bowels which in turn set up irritation. Well done meats, as well as sauces and preserved fruits, will often produce intestinal irritation in a great many of these patients.

We must not confuse ordinary dyspepsia with tuberculous enteritis. In a great majority of the pulmonary tuberculous cases that are complicated with gastro-enteritic disturbances tubercles are found in the intestines. It does not necessarily follow, however, that because evidence of tuberculous infection is found in the intestinal tract the gastro-intestinal disturbance is necessarily a clinical tuberculous enteritis. There is little question that when the pathology of these tubercles shows a state of activity the enteritis is probably due to the tuberculous condition. However, in the mild cases the intestinal tubercle may be found and still, being of a healed type, may not be causing any disturbance even though gastro-intestinal manifestations are present in the patient. In other words, even in the intestinal tract we must differentiate in the presence of tuberculosis whether there is clinical tuberculous enteritis present or only intestinal tuberculous infection without any clinical manifestations. When the first signs of abdominal trouble appear we must endeavor by all our available resources to learn whether or not it is the tubercle that is at the base of the enteritic trouble, or some non-tuberculous condition complicating the pulmonary lesion.

DR. H. T. HELMHOLZ: I would like to say a word about the cutaneous tuberculin reaction. I think the pendulum has swung too far in the opposite direction, in that we rely very little on a positive or negative tuberculin reaction. I think that is true if we use it in the way that it is ordinarily used, merely one or possibly two tuberculin reactions, according to Pirquet. As you all know, a positive tuberculin reaction means merely that some time or other the individual has had an infection with the tubercle bacillus. On the other hand, a negative tuberculin reaction, I believe, is of definite value, providing it is properly done.

One, two or more Pirquet reactions mean nothing. A gradual increase in the dosage of an intracutaneous reaction that remains negative even when as much as one or two milligrams are given I feel sure is of very definite value in excluding tuberculosis. We all know that miliary tuberculosis does not give a positive Pirquet reaction, but, if the dosage is increased, as has been shown by Hamburger and Casparis, even in those cases one can obtain intracutaneous reactions. Just recently we had an

experience with a different type of case where the tuberculosis was so completely healed that there was no reaction. In this case of tuberculosis of the spine we increased our dosage because we thought we were unquestionably dealing with tuberculosis. With one milligram of tuberculin given intracutaneously we obtained positive tests. So I feel that a negative tuberculin test, if properly carried out, is of great help in excluding tuberculosis.

DR. J. A. MYERS, Minneapolis: No one who has observed Dr. Bendes' patients at the Glen Lake Sanatorium can question his splendid results. Although the changes which occur in the body of the tuberculous treated by heliotherapy are not as well understood as in rachitic cases so treated sufficient data have accrued on the subject to prove that it deserves a very definite place in tuberculosis therapy. In my opinion heliotherapy has four distinct effects upon patients: first, the chemical action of the rays; second, a period of almost absolute rest which many patients would not take otherwise; third, a daily air bath which is of unmistakable value in treating tuberculosis; and fourth, the psychic effect. The patients feel that something is being done for them and often will remain under treatment much longer and consequently develop more permanent healing than otherwise would be obtained.

Every practitioner of medicine who treats tuberculosis should become familiar with the technique and the indications of heliotherapy. Too often we think such special procedures are for institutions and have no place in private practice. This is far from true and in fact would be undesirable. When we consider the large number of tuberculous patients in this state and the small number of sanatorium beds, it is obvious that more tuberculous patients must be treated by private physicians than by sanatorium physicians. Often it is a long time after an application is filed until a patient can be admitted to a sanatorium. It is not right that during this waiting period patients should be deprived of such special therapy as heliotherapy if it is indicated. Again, very few patients are cured in a sanatorium, but most of them return to their homes for a long period of convalescence during which time they are under the care of their private physicians, where indicated heliotherapy should be continued in the home.

In Minnesota considerable natural sunlight is available during the spring, summer and autumn months. On cloudy days and during winter months artificial sun lamps may be used in the homes. In every case heliotherapy in the home must be under the most careful guidance of a physician who not only prescribes the dosage but also keeps the patient under very close supervision.

PROBLEMS ENCOUNTERED IN THE TREATMENT OF DISEASE OF THE BILIARY TRACT*

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The results of operations performed for gallstones and inflammation of the biliary tract are, as a rule, satisfactory. Few fields of surgery offer as good results as does this one. There are certain problems which we are constantly encountering, and with which we are doubtless making some headway, but it is not always possible to secure the desired results. Our present ideas of the source of infection, and the manner in which it is distributed to the adjoining tissues are so different from our former conception that they may eventually help us to solve some of the problems. Inflammation of the liver, and probably also of the pancreas, in association with infection of the gallbladder, may account for the persistence of symptoms in some cases, or for their recurrence after the gallbladder has been removed. At present, it does not seem that this conception will change our plan of surgical treatment; however, it does suggest that the choice of procedure is the removal of the gallbladder.

Generally the clinical symptoms in cases of disease of the gallbladder are very definite and clear-cut, and a positive diagnosis can be made in most cases. Occasionally, however, the usual gallbladder syndrome is present, and yet at the time of operation it is impossible to find sufficient evidence of inflammation in the gallbladder or biliary tract to explain the symptoms adequately. In some cases, undoubtedly, the diagnosis has been incorrect and the symptoms were due to a lesion elsewhere; in others, I believe the trouble does exist in the biliary tract, but is not yet recognizable, as in early cases of primary hepatitis in which the gallbladder is only slightly involved; or in early cases of primary pancreatitis. Since we have been making careful observations on the condition of the liver and the pancreas when operating for gallbladder disease, we are recognizing changes that often exist in association with cholecystitis, which formerly were not interpreted.

SYNDROME OF CHOLECYSTITIS WITHOUT MUCH INFLAMMATION IN THE GALLBLADDER OR IMPROVEMENT AFTER CHOLECYSTECTOMY

The symptoms in the following case (Case 1) led to the belief that the patient was suffering from cholecystitis. In spite of the fact that the findings were not definite, it seemed best to remove the gallbladder, and this was done some months ago. The patient reports that her condition is not much improved. This does not necessarily mean that the operation was a failure, for if she was suffering from a chronic hepatitis or pancreatitis, it is still possible that she may obtain relief through the operation. However, it is also possible that our interpretation of the case was not entirely correct.

Case 1 (A428477). Mrs. E. M., aged forty-three years, had had marked gastric disturbance for twelve years, characterized by irregular attacks of colic and belching of gas. Five years before coming to the Clinic, she had had a severe epigastric colic, with pain referred to the right shoulder. Morphine was necessary to control the pain. Residual soreness in the gallbladder area and slight jaundice followed. She had had many minor attacks since that time. She was markedly constipated, and it was necessary to regulate her diet.

The findings at examination were essentially negative. At operation, July 13, 1923, the gallbladder was found buried in adhesions and involved in a moderate inflammatory process. There was moderate hepatitis. Cholecystectomy was performed. The patient's convalescence was uneventful.

CLINICAL SIGNS OF GALLBLADDER DISEASE WITHOUT MUCH EVIDENCE AT OPERATION OF DISEASE IN THE BILIARY TRACT

More than once, after a diagnosis of gallbladder disease had been made, I have had occasion at operation to refuse to do anything with the gallbladder because it appeared normal. However, some of these patients have returned in a comparatively short time because of the persistence of their trouble, and have been relieved by secondary removal of the gallbladder. Our experience suggests that inflammation may exist in the gallbladder or biliary tract with little if any gross evidence of it. In the future it may be possible to recognize the conditions which cannot be interpreted at the present time. In some cases in which gross evidence of trouble was not sufficient to warrant cholecystectomy, the gallbladder was opened and a specimen excised from the wall for microscopic examination. In an endeavor to reach a proper conclusion with regard to these cases, the ease with

*Read before the Minneapolis Surgical Society, January 10, 1924.

which the gallbladder may be compressed, the thickness of the wall, the character of the bile, and the amount of fat deposit in the wall as an indicator of a chronic inflammatory process, have been considered, but even these details do not seem to help materially. Case 2 illustrates the type in which there are clinical signs of disease in the gallbladder without much evidence of disease at operation:

Case 2 (A445832). Mrs. R., aged twenty-five years, had had attacks of epigastric pain, every four to six months for four years. They lasted about a day, were accompanied by severe vomiting, and were often followed by slight jaundice, lasting a week. The pain was not referred, but was so severe as to require hypodermics. Between attacks, the patient had considerable gaseous dyspepsia with intolerance for greasy foods. During the last two years the character of the distress had changed somewhat, localizing at times (about a week prior to the menstrual period) in the right lower quadrant.

At examination the urine and blood findings were normal. The x-ray of the stomach was negative. Gastric analysis revealed total acidity 40, and free hydrochloric acid 20. At operation, November 6, 1923, very slight cholecystitis was found; chronic catarrhal appendicitis was present. The gallbladder and appendix were removed. The convalescence was uneventful.

SUBACUTE CHOLECYSTITIS, RUPTURED GALLBLADDER, WITHOUT MARKED SYMPTOMS

Case 3 is in direct contrast to Case 2, and illustrates how extensive the infection in the biliary tract may be without producing severe symptoms. The patient had never had sufficient pain to disable her to any extent, and at the time she presented herself at the Clinic, her examination was essentially negative, although it seemed from the history that she might have a mild degree of cholecystitis. At operation a day or two later, a ruptured gallbladder was found, many stones were present, and the infection, although of low grade, had a tendency to spread and form abscesses, which shows that a patient who has cholecystitis should, under ordinary circumstances, be operated on.

Case 3 (A445069). Mrs. D., aged forty-three years, had had a drawing feeling in the epigastrium with loss of appetite and moderate dyspepsia for two years before coming to the Clinic. She had dieted. There had been a loss of 35 pounds in weight. One month before, she had had an attack of generalized abdominal pain lasting one-half hour, and relieved by hot applications. She had vomited once, but had never been so disabled that she was obliged to go to bed.

The findings at examination were essentially negative, except for tenderness at the umbilicus. There was no free acid in the stomach. The condition was diagnosed as a possible cholecystitis. At operation, October 25, 1923, an

empyematous gallbladder, which had ruptured into the liver, was found. There were many stones. The appendix was inflamed. Cholecystectomy and appendectomy were performed. Two Penrose drains were inserted.

The convalescence was uneventful.

ACUTE GANGRENOUS CHOLECYSTITIS

One of the problems of interest in connection with the study of these cases is the rapidity with which the gallbladder may become gangrenous. At the time of the operation, there is generally a little ascites, the gallbladder is usually practically free from adhesions, but tense and thick, and when removed, the mucous membrane is black and necrotic, apparently entirely devoid of circulation. It is possible that a stone (in cases of cholelithiasis), or an inflammatory process, may obstruct the neck of the gallbladder and interfere with the circulation, although when a stone blocks the cystic duct, a hydrops of the gallbladder usually results. It is more than likely that, in these acute gangrenous conditions, emboli form in the vessels as a result of the inflammation, and the gallbladder is completely destroyed. Such a condition is illustrated in Case 4. The patients frequently suffer with more or less constant excruciating pain, requiring morphin for relief. Often the condition is mistaken for pancreatic necrosis in association with cholecystitis. In such cases, however, there will be more shock and inability to control the attack, which terminates fatally within a few days. If the patient has a gangrenous gallbladder without pancreatic necrosis, there is usually not the same evidence of shock and general reaction. Most of these patients recover. However, it is my opinion that unless there are some definite contraindications, such black, necrotic gallbladders should be removed rather than drained:

Case 4 (A441154). Dr. S., a man, aged forty-six years, had had one mild attack of colicky epigastric pain, three months before coming to the Clinic, and one week before, a more severe attack, followed by residual soreness and toxemia. The temperature was 101°; soreness and some pain persisted.

At examination the right upper quadrant was very tender. The gallbladder was palpable and distended. There was a tinge of jaundice. The temperature was 98.6°. The leukocytes numbered 22,000. Operation was advised. The patient was kept in bed for five days. The temperature was 101°, but gradually subsided. The leukocyte count decreased to 10,100.

Operation was performed September 14, 1923, twelve days after the onset of the last attack. The gallbladder was found to be distended and gangrenous, the mucous membrane black, and stones were impacted in the cystic duct.

Cholecystectomy was performed. One split tube with gauze and one gauze pack were inserted. The drains were removed on the ninth and eleventh days. Convalescence was uneventful.

RECURRENCE OF CALCULI IN THE GALLBLADDER

Another problem which has been widely discussed is the recurrence of stones in the gallbladder after cholecystostomy. Although cholecystostomy is satisfactory in the majority of cases, symptoms continue to recur in too many instances to warrant its performance except in special cases. Usually the symptoms in these cases are due to the continuance of the infection in the gallbladder, or to the secondary formation of stones. Case 5 illustrates this point. Secondary removal of the gallbladder has been necessary in so many instances as to indicate primary cholecystectomy in most cases.

Case 5 (A56171). Mrs. G., aged fifty-two years. In 1911 the patient had had a cholecystostomy to relieve gallstone colic which had persisted for twelve years. Four years later, following a severe infection in her hand, the colics returned, and recurred about once a month, until the time of her admission to the Clinic. She had not had jaundice.

September 27, 1923, cholecystectomy without drainage was performed. The gallbladder was contracted and destroyed; one stone was impacted in its neck, but there were no other calculi. Convalescence was uneventful, and the patient was dismissed from the hospital on the sixteenth day.

COMMON DUCT STONE

When the common duct is involved in an inflammatory process or contains stones, a much more serious problem is presented. There is interference with the flow of bile into the intestine, usually resulting in jaundice. Common duct stone is distinguished from carcinoma of the ampulla, obstructive pancreatitis and other obstructing inflammatory conditions by interval attacks over a period of years, associated with more or less jaundice, which clears up in the interim between attacks. If the obstructing lesion is a neoplasm, the jaundice is usually painless and gradually deepens, although it may fluctuate from time to time. However, we must always bear in mind that some cases of common duct stone have associated painless jaundice, and that unless there is some definite contra-indication, an exploration should be made to determine definitely what the condition is. Most patients with common duct stone will get well, whether they are operated on during the interval between the attacks, when the jaundice is subsiding, or during the attack. In Case 6 the patient was allowed to go

home, because his jaundice seemed to be subsiding; the plan was to operate when the jaundice had disappeared. However, he returned in a few days much more deeply jaundiced, having had another attack, and it was necessary to perform the operation without further delay. Generally it is best to carry the patient along until he is as free from jaundice as possible. As a rule it is better not to remove the gallbladder from a jaundiced patient, but to drain it and the common duct separately after the removal of the calculi. Removal of the gallbladder during the stage when biliary cirrhosis is present sometimes leaves an oozing surface, difficult to control by suture, and necessitating gauze packing. Bleeding may occur when the pack is removed, and serious results follow. Furthermore, the gallbladder is nearly always completely destroyed and its removal later may not be necessary.

Case 6 (A445588). W. Z., a man, aged fifty-three years, had had a sudden severe epigastric colic, characteristic of that observed in association with gallstones, a year and a half before coming to the Clinic. Vomiting had been associated. One year later, painless jaundice occurred, and persisted, with the exception of a few short remissions. Chills and sweating had occurred almost every month, with deepening of the jaundice after the chills.

At examination, the patient was jaundiced, and had lost 25 pounds in weight. There were no other significant findings.

The patient returned home to have treatment with calcium lactate, but came back three weeks later with somewhat more marked jaundice and a coagulation time of ten minutes; it had been four minutes at the time of his first examination.

November 28, 1923, cholecystostomy and choledochostomy were performed. The gallbladder was destroyed and filled with stones. Stones were impacted in the ducts, several being removed from the hepatic ducts. One large Robson drain and one Penrose drain were used. The patient was dismissed on the twenty-fourth day with his wound healed, general condition improved, sclera white, and bowel movements dark.

COMMON DUCT STONE AFTER CHOLECYSTECTOMY

It has been suggested that the common duct is more prone to be the seat of stone formation after the removal of the gallbladder. This hypothesis was based on the assumption that the common duct would take up the function of concentrating the bile which the gallbladder had performed, but apparently this does not occur. Recently we sent follow-up letters to one hundred patients whose gallbladders had been removed more than twenty years before, and in a study of this series we have found only one instance in which there was reason

to believe that stone had formed in the common duct after the cholecystectomy. Case 7 is one in which stone was found in the common duct after removal of the gallbladder. It would be entirely possible to overlook stones at the primary operation, and it seems probable that these stones were in the ducts at the time of the cholecystectomy:

Case 7 (A439983). C. O., a man, aged fifty-six years. Because of colic and jaundice, the patient had had his gallbladder removed five years before coming to the Clinic. The jaundice cleared up within a year, but during that time he had had an operation for adhesions. Following this, he remained well until three months before admission, when he had chills, nausea, and jaundice, but no pain.

At examination, he was moderately jaundiced, with bile 3 on a scale of 4, in the urine. His coagulation time was twelve minutes, but this was reduced to five and one-half minutes by three injections of calcium.

At operation, September 11, 1923, multiple stones were found in the common duct, one in the left hepatic, and one lodged at the ampulla. The stones were removed with a scoop, and a Mayo-Robson drain inserted. The drain was removed on the eleventh day. The stools on the fifteenth day were greenish. The patient left the hospital on the twenty-third day, and was dismissed from the Clinic on the thirty-fifth day. The jaundice had almost entirely disappeared, the stools were dark, and the wound had healed. A letter received recently states that the patient has continued to improve.

In Case 8 it is definitely known that stones were present in the gallbladder at the time of the cholecystectomy which had been performed twelve years before. The patient was well for seven years before the occurrence of any further symptoms, and there had been no jaundice, chills, or fever at any time since the cholecystectomy, which could be explained by the fact that the stone which we found at the second operation was so small that it had not caused complete obstruction of the duct, although it was of sufficient size to produce typical symptoms. This may be a case in which the stone formed after the removal of the gallbladder:

Case 8 (A445943). Mrs. H. E., aged fifty years, came to the Clinic in November, 1923. In 1911, she had had cholecystectomy for typical gallstone colic, and stones were found. She was well up to 1918, but since then had had attacks similar to those before operation, coming on at first at long intervals, but later, once or twice a week. The pain was colicky, requiring hypodermics, and radiating to the back. There had been no jaundice, chills, fever, or rise in temperature at any time.

The physical examination was essentially negative. November 22, 1923, choledochostomy was performed, and a small stone removed from the common duct. The liver and pancreas were grossly normal. The discharge from the wound stopped on the thirteenth day, and the drain was

removed. The patient was dismissed on the twenty-fourth day in good condition.

CHOLANGITIS AFTER CHOLECYSTECTOMY

We have been much interested in a group of cases in which there was a continuance or recurrence of symptoms after cholecystectomy, and in which we operated expecting to find common duct stones, but were disappointed. All of the patients had had typical gallstone colics from three months to seven years after cholecystectomy. Jaundice was not a common symptom, and in no case was it deep. At the secondary operation we found the common duct dilated as is usual following cholecystectomy, whether stones are present or not. We opened and explored the ducts, passing probes and scoops up into the hepatic ducts and down through the common duct into the duodenum, but no stones were found. About four-fifths of the patients were relieved of their symptoms, whether from cholangitis, hepatitis, or pancreatitis, by secondary drainage of the liver ducts; however, it does not seem that this procedure is warranted at the time of cholecystectomy, as only a very small percentage of patients have sufficient trouble of this kind to warrant secondary operation.

Case 9 (A145261). Mrs. W. H., aged forty-seven years, came to the Clinic in October, 1923. In 1916, she had had a cholecystectomy for a strawberry gallbladder containing one stone. She was well until 1921, when she had a sudden chill, temperature 104°, and severe upper abdominal pain requiring hypodermics for relief. There was no jaundice. Since then, she had had intermittent attacks, about three months apart, consisting of severe pain, vomiting, chills, and fever. On one occasion only was there any jaundice. After some of the attacks, the patient had night sweats for one or two weeks.

The examination was essentially negative. At operation, October 24, 1923, the common duct was four or five times normal size. I had difficulty in introducing a probe, but succeeded in getting a hemostat through, and then a large scoop, but no stones could be demonstrated. A Mayo-Robson drain was inserted and left in place seventeen days, until drainage ceased. The patient was dismissed on the twenty-second day, with stools and skin normal.

CHOLANGITIS

Another group of cases, in which cholangitis seems to be the chief cause of the patient's complaint, presents a serious problem. Case 10 is representative of this type. Following cholecystectomy and drainage of the ducts, the patient was relieved for only three months. Then secondary drainage of the duct was established for three months, but this has not afforded relief, and at the

present time the patient is suffering from attacks similar to the original ones, consisting of chills, with a rise in temperature, but no pain or jaundice. Some of these patients undoubtedly should have long-continued drainage of the liver ducts by means of the Deaver T-tube, and if this particular patient returns, this treatment will be instituted.

Case 10 (A418277). C. P., a man, aged fifty-seven years, came to the Clinic in February, 1923. A few years before he had had a typical gallstone colic with jaundice, but after that remained well until 1920, when he again had epigastric colic, chills, fever and jaundice. A similar attack occurred in 1921, and another in 1922. The latter was not definitely colicky. During the last year the patient had had several attacks of malaise, chills, and fever, without colic or jaundice. Calomel gave definite relief.

At examination the liver was enlarged, but there was no jaundice. Examinations of the urine and blood were negative.

At operation, February 23, 1923, cholecystitis with cholelithiasis and associated cholangitis were evident. The common duct was dilated, but no stones could be demonstrated in it. Cholecystectomy and choledochostomy were performed. One Mayo-Robson drain was stitched into the hepatic duct. The patient was dismissed on the thirty-first day, with the wound completely healed. He went home and was free from trouble for three months. He then began to have attacks similar to those previously experienced, with a sudden rise in temperature to 103°. There were no chills. These attacks occurred weekly, lasted about three days, and were apparently checked by calomel. Smears and repeated blood cultures were negative. Quinin had no beneficial effect.

September 7, 1923, a Mayo-Robson drain was inserted into the common duct for prolonged drainage. Marked pancreatitis and hepatitis were present. The common duct was enlarged, but no obstruction was demonstrable. The patient improved, and returned home, wearing the drainage tube, which ceased to drain, or drained only intermittently, after two months, and was removed. December 30, he wrote that he had had a recurrent attack of fever lasting three days.

HEMOLYTIC ICTERUS AND GALLSTONES

Gallstones may be present without being a factor in the production of jaundice. It is always well to bear this fact in mind and remember that the patient may have hemolytic jaundice. Although there may be some relation between the existing cholecystitis and the biliary condition that attends it, removal of the gallbladder will not clear up the jaundice. The distinction between hemolytic and obstructive jaundice can be made by a careful study of the clinical history. In the former, there is usually a family history of jaundice, or the jaundice has existed since childhood. Furthermore, there is little if any bile in the urine, and the examination of the blood will show an increase in the

fragility of the red cells. The spleen is usually large and can be palpated. Treatment in these cases should consist of splenectomy, and removal of the gallbladder at the same time or shortly afterward; an operation for only one of the two conditions will not be sufficient.

Case 11 (A310506). A. R. M., a single man, aged thirty-one years, had been somewhat yellow as a child. There was no family history of jaundice. He had had severe attacks of epigastric distress when he was five years old, during an illness which was diagnosed pneumonia. The attacks recurred and had become more numerous during the last eight years. He was markedly jaundiced immediately after an attack, and slightly jaundiced between attacks.

At examination the patient was slightly jaundiced. There was no bile in the urine. The spleen was palpable. The hemoglobin was 75 per cent; erythrocytes numbered 4,430,000. There was moderately increased fragility of the erythrocytes. The x-ray revealed a diseased gallbladder containing stones.

At operation, November 19, 1923, the spleen was three times normal size (185 gm.), and was removed. There was moderate fibrosis and destruction of the malpighian bodies. The gallbladder was filled with stones, but it seemed best to postpone further operative procedure. November 30, cholecystectomy and appendectomy were performed. The gallbladder contained many stones, was thickened and inflamed. A marked hepatitis was present. The appendix was obliterated throughout.

WHITE BILE

It was formerly supposed that the presence of white bile in the common duct indicated that the liver function was entirely suspended, and that the case would terminate fatally, but investigations recently carried on at the Rockefeller Institute show that this colorless fluid in the common duct is not bile, but is secreted by the walls of the common duct under sufficient pressure to hold the bile back in the liver. Within a few hours after the duct is opened and drained, in most instances, the drainage changes and normal-appearing bile is seen. It is not known why we do not find this clear colorless fluid in all cases in which the common duct is completely obstructed. Experimental work has shown that if the common duct is ligated below the entrance of the cystic duct, so that the gallbladder retains its communication with the biliary tract, this white fluid is not secreted. In certain cases in which the gallbladder is out of commission, and complete obstruction of the common duct by stricture is suspected, a slight amount of bile may pass through the strictured area, and thus explain the absence of the colorless fluid. According to our observations in these cases of so-called white

bile in the common duct, the results of operations on the common duct are just as satisfactory as in any of the deeply jaundiced patients. In Case 12 there was a quantity of this clear fluid in the biliary ducts at the time of operation:

Case 12 (A294436). Mrs. C. C., aged forty-three years, came to the Clinic in October, 1919. She had had gallbladder disease since 1903, and cholecystectomy had been performed in August, 1918. Two months later, persistent jaundice had developed. She had lost 25 pounds in fourteen months.

At examination jaundice was marked, and bile 2 was found in the urine.

November 4, 1919, hepaticoduodenostomy was performed. There was complete obstruction of the hepatic duct at the site of the cystic duct. There was no bile in the ducts, but 200 c.c. of clear fluid were found. The pancreas was normal. On the sixth day after operation there was slight drainage of bile from the wound, but none thereafter.

Convalescence was uneventful, and the patient was able to leave the hospital on the seventeenth day, with the wound practically healed, and the jaundice subsiding rapidly. In a recent letter, the patient writes that for two years after the operation she was in excellent health, but since then has had attacks of colicky abdominal pain at intervals of from two to eight weeks, very similar to those which she experienced before the removal of the gallbladder, in 1918.

STRICTURE OF THE COMMON DUCT AFTER CHOLECYSTECTOMY

One of the most serious complications we have to contend with in surgery of the biliary tract is the occurrence of stricture in the common duct after cholecystectomy. Undoubtedly some of these strictures result from technical errors; in other cases, however, it is impossible to determine just why stricture occurred, as the patients seem to have been entirely well for a number of months after the gallbladder was removed. During this time the bile apparently passed normally down the duct, and then without any known cause a painless jaundice developed. In certain instances as much as nine to twelve months elapsed without any indication that the lumen of the duct was not entirely normal. In some of these it seems possible that a hematoma formed, or that as a result of packing with gauze or a large drain, sufficient scar tissue may have developed to cause stricturing of the duct when the tissue had contracted. I am inclined to believe that since we are closing the wounds in more of these cases with little or no drainage, we have seen fewer cases with this very serious sequence.

Case 13 (A451152). Mrs. S. B., aged fifty-five years, came to the Clinic in January, 1924. She had had a chole-

cystostomy in 1913 without relief of symptoms. Following cholecystectomy, in 1921, her condition was improved for about one year, then there followed nine months of indigestion and some pain. During the last three months, she had had four or five attacks of sudden onset and great severity, requiring morphin. Chills and some fever were associated with these attacks. The patient was not free from jaundice at any time during these three months.

At examination, a small mass was palpated in the right upper quadrant. The patient was deeply jaundiced. The coagulation time was ten minutes.

Operation was performed January 2, 1924, after pre-operative preparation with calcium. The patient had biliary cirrhosis from stricture of the common duct following cholecystectomy. A small stone was found in the common duct above the stricture, and calculi were present in the hepatic ducts. The duodenum was opened at a point about 3.75 cm. below the pylorus, and a rubber tube passed into the opening, and also into the hepatic duct; the duct was then anastomosed to the duodenum over the tube.

MALIGNANCY IN THE BILIARY TRACT

Fortunately malignancy of the gallbladder is rare. When it does occur, stones are always found in association with the condition. It is sometimes difficult to distinguish between cancer of the fundus of the gallbladder and empyema with thickened walls and necrosis. Occasionally an operation may be well under way before it is realized that malignancy is present. Because of the rich lymphatic circulation between the gallbladder and the liver it is hardly conceivable that malignancy could exist in the gallbladder for any length of time without extension into the liver. Moreover, radical operations for cancer of the fundus of the gallbladder have not been very successful, probably because of this rich network of lymphatics. A case of cancer of the gallbladder with cholelithiasis (Case 14), and one of primary cancer of the cystic duct (Case 15) are reported:

Case 14 (A59903). Mrs. E. F. G., a woman, aged sixty years, came to the Clinic in August, 1923. She had had mild epigastric cramps for two years, and an attack of severe colic two weeks before examination. Three days after the attack, a lump was discovered in the region of the gallbladder. She had lost 10 pounds in weight in the last six months.

At examination, there was a mass in the region of the gallbladder. There were no other significant findings.

August 7, 1923, cholecystectomy was performed. Acute cystic cholecystitis was present, and cholelithiasis. A large cancer was found in the fundus of the gallbladder. A nodule was removed from the liver, and was reported "inflammatory" by the pathologist. Following operation, pleurisy with effusion developed, and a small quantity of fluid was aspirated. The patient was dismissed on the twenty-eighth day. She returned to the Clinic October 24, 1923, to be checked up on account of her fear of a return

of the malignancy. She was in good condition, felt well, and had an excellent appetite.

Case 15 (A446388). E. B., a man, aged fifty-six years, came to the Clinic in November, 1923. Two years before, he had had a sudden attack of colicky pain in the right upper abdomen, without nausea, vomiting, or fever. Several similar attacks followed, in some instances requiring morphin. Then the patient was well until three weeks before coming to the Clinic, when he had an attack of aching pain in the upper abdomen. At this time his home physician discovered a movable mass. The patient had lost 18 pounds in weight.

At examination, the hemoglobin was 73; the urine, normal. The phenolsulphonephthalein test gave a 60 per cent return. Roentgenograms of the bladder, ureters, and kidneys were negative, as were also the cystograms and pyelograms.

Operation was performed November 9, 1923. The palpable mass was found to be a large hydrops of the gallbladder. At the distal end of the cystic duct there was a mass 2.5 cm. in diameter, hard, indurated and intimately attached to the surface of the liver. This mass and the intact gallbladder were removed. The gallbladder contained about 300 c.c. of pus, mucus, and stones. An ulcerated carcinoma with a large gallstone firmly fixed in the center, involved about 1 cm. of the mucosa of the cystic duct. Two Penrose drains were used and were removed on the sixth and eleventh days, respectively. Convalescence was uneventful. The patient was dismissed on the eighteenth day after operation, with the wound healed.

This is the only case of primary cancer of the cystic duct that I have seen. The gallbladder was large and distended, and there were stones in it. The cancer in the duct was rather small and had not invaded the common duct; hence there was no jaundice. However, the growth was attached to the liver, and while removal was apparently satisfactory, I am afraid the ultimate results may be influenced by the fact that some of the lymphatics of the liver may be involved.

CONCLUSIONS

In conclusion I wish to emphasize the fact that the results of operations for inflammations in the biliary tract are, as a rule, very gratifying. The gallbladder may be removed, stones taken from the common duct and the biliary tract drained, and the individual return to a normal state of health in a short time with very slight prospect of ever having any further trouble.

The case histories which I have given here, tonight are those of patients who have presented definite problems. It is through the study of groups of cases of this kind that we hope to be able to overcome our difficulties and make still further progress in the treatment of these patients.

DISCUSSION

DR. STRACHAUER: Dr. Judd has certainly very successfully staged an old-fashioned "hard time party," and, of course, it is from the mistakes and unsuccessful cases that we learn and profit. It surely must be understood, however, that the cases he has presented form a very small percentage and that the great majority of cases which have had a cholecystectomy performed have been successful and satisfactory and have had no occasion to return to Rochester or elsewhere.

The consideration of cholecystectomy versus cholecystostomy always comes up in the discussion of the subject of cholecystitis. My personal experience goes back not alone to the time when cholecystostomy was invariably performed, but to the time when it was considered desirable to suture the gallbladder to the parietal peritoneum. Some of the acute cases were sutured to the peritoneum and left for several days for adhesions to form before opening the gallbladder.

The results of cholecystectomy are so much more satisfactory than from cholecystostomy that there is no comparison. Even the laity have become educated to this fact, and I have had a number of patients, requiring gallbladder surgery, tell me that they wanted me to be sure to remove the gallbladder, citing the experience of some friend or relative who had had the gallbladder "only drained" without satisfaction and that later removal of the organ was necessary.

Cholecystostomy, when performed, except in the aged, debilitated and nephritic, should be done as the first step in a two-stage operation, the second stage being a cholecystectomy, and the acuteness of the infection in the gallbladder at the first operation being such as to contraindicate the immediate removal of the organ.

Regarding the acutely inflamed gallbladder I wish to particularly stress the following: As far as I am personally concerned I have never had nor seen one case of acute cholecystitis die without operation. The mortality chapter—the dark chapter—in surgery of the gallbladder has to do with acute cholecystitis. The situation is not comparable to acute appendicitis. The acutely inflamed appendix and the gangrenous appendix are prone to undergo rupture and perforation, and, of course, the diagnosis of acute appendicitis carries with it the indication for a prompt operation. Not so the acutely inflamed gallbladder. In my entire University Hospital experience and private practice I have seen only two cases of rupture of the gallbladder. In one of these the abscess was well walled off by the omentum and surrounding structures, and the patient, a man 79 years of age, was walking about the city of Minneapolis in comparative comfort. Both of these patients got well. We all know that operation on the acutely inflamed gallbladder is an extremely dangerous one. In removing the organ we open up a raw area of the liver which bleeds freely and offers an inviting avenue for the extension of the infection. Post-operatively the liver function is interfered with and acidosis develops. If these acutely inflamed gallbladders are operated upon, cholecystostomy as a first-stage operation should be performed. Personally, I put the patient to bed, in a hospital, on liquid

diet, with morphin to inhibit peristalsis, and avoid catharsis. Daily leucocyte count is made, and under this regime no case developed surgical complications nor required emergency operation. When the acute phase of the infection has subsided and the patient is taking fluids generously, eating and sleeping well, I go in and remove the gallbladder. The extra-hazard has passed and the patient can be safely operated upon. Bevan, among others, is one of the outstanding exponents of this practice of waiting for the favorable stage before operating and not unnecessarily exposing the patient to this avoidable danger.

It is extremely important to avoid the use of the cigarette or gauze drain, as the latter undoubtedly are responsible for inflammatory stricture of the common duct and adhesions in the neighborhood. I am confident that our increasing ability to close these cases without drainage will result in the elimination of a definite number of unsatisfactory post-operative results.

Dr. Judd called attention to the work of Graham and his associates on the relation of hepatitis to cholecystitis. Dr. Judd's slides show only the advanced degrees of hepatitis. By routinely taking a section of the liver for microscopic examination it is surprising how frequently a seemingly normal liver will show round-cell infiltration, indicating hepatitis. Dr. Graham believes that the route of infection to the gallbladder is by way of the portal vein to the liver and by way of the lymphatic communication between the liver and gallbladder to the latter organ. While this route of infection has not been absolutely proven, there is no question about the intimate relationship between the liver and the gallbladder, and the infection at various times, in all probability, travels both ways back and forth between the liver and gallbladder. The removal of the gallbladder breaks this vicious circle, and the illustrations shown by Dr. Judd this evening, in my opinion, emphasize the importance of an early removal of the gallbladder so as to prevent the increasing degree of hepatitis.

Surgeons are regularly confronted with the difficulty of establishing the diagnosis of chronic cholecystitis even when they can see and palpate the gallbladder at the time of operation. The color of the organ, the subserous deposit of fat, the thickness of the wall, the condition of the regional lymphnodes and presence of adhesions are, of course, all to be taken into consideration. Positive evidence at times, however, is absent in a case with a positive history of gallbladder disease. I wish to offer as a diagnostic procedure at the time of operation the removal of a section of the liver for immediate frozen section examination, and suggest that in the presence of round-cell infiltration the gallbladder be removed.

In conclusion, as a matter of passing interest I wish to cite the case of Professor Barker, of Baltimore, who, when 8 years of age, had typhoid fever; 35 years later, at the age of 43, he was operated upon for gallstones. Professor Chas. R. Austrian, bacteriologist at Johns Hopkins, grew a pure culture of typhoid bacilli from the gallstones, and there had been no repetition of the typhoid infection since the age of eight.

DR. A. E. WILCOX: The problems of gallbladder surgery have been most excellently exhibited in the cases shown

by Dr. Judd this evening. The difficulties encountered in determining real pathology from the gross appearance in the biliary area have been emphasized, and Dr. Judd's opening remarks emphasize one point which has always been a problem to me. That is, frequently we have a typical syndrome, and we are sure our diagnosis is correct, that is, cholecystitis or gallstones with positive indications for operative procedure, but upon opening the abdomen we find what appears to be a normal gallbladder, no stones are palpable and not a definite gross excuse for excision. In these cases we may find an accompanying diseased appendix, upon removal of which all symptoms cease. Yet, on the other hand, we periodically find that symptoms persist, and we are in a quandary as to what the real cause of the trouble is.

To state that the gallbladder is normal is a difficult problem. I am not sure that I know what a normal gallbladder looks like, or at least I am satisfied that a normal appearing gallbladder is very deceptive.

I believe that the clinical syndrome sufficient to make a diagnosis is sufficient indication for excision of the gallbladder providing the appendix shows no pathology. However, it is a matter of surgical judgment in each individual case as to just what will be done when the abdomen is opened in this type of case.

I have had excellent results since I have been encouraged to close some of these abdomens without drainage, and I feel a great step forward has been made by so doing.

The question of hepatitis, cholangitis, and pancreatitis are still problems to be solved and involvement of the common duct not only requires unusual surgical skill but rare judgment as well in determining between cholecystectomy or drainage of the gallbladder in conjunction with drainage of the common duct.

Dr. Judd's paper, as usual, has been extremely instructive, and his results are very consoling to those of us who meet these problems occasionally. We are deeply indebted to him for this interesting paper, and the society is to be congratulated upon having provided for its presentation.

DR. A. L. CAMERON: (Requested to cite his case which had been previously reported.) My case concerned a man thirty-two years of age whose history was quite typical of recurring attacks of cholecystitis without jaundice over a period of three years. At the time of operation the gallbladder was found to be greatly distended and tense. Upon palpation the cystic, hepatic and common ducts appeared normal. The gallbladder appeared quite acutely inflamed, and for that reason it was decided best to drain it. It was opened at the fundus and completely evacuated of a mucoid, colorless material.

Following this, normal looking bile flowed freely to the exterior. Evidently an obstruction had obtained in the cystic duct, presumably a mucous plug.

With my finger inside the gallbladder I determined definitely that no stones were present. The gallbladder wall was very thin and due to the absence of adhesions was readily palpated throughout. The gallbladder was drained.

Eighty-six days later, following several attacks of right upper abdominal quadrant pain the patient was again operated upon. At this time the gallbladder was found to be shriveled up, thick walled and full of stones. These

calculi without doubt had formed subsequently to the first operation.

DR. WILLARD D. WHITE: I was much interested in that part of Dr. Judd's paper which told about these cases where he got a pretty definite history making you think you had pathology in the gallbladder and then, when the gallbladder was opened, very little was to be seen pathologically. I was interested in that especially because I have seen cases where I think a definite mistake has been made because the history showed the attacks to have been quite severe. Some cases may require morphin. They may or may not vomit, may or may not have a slight rise in temperature, but usually do not. In this particular type of case you will find very often that the patient has been using cathartics very frequently over a long period of time so that he will get a definite bowel distress, which may very easily be confused with gallbladder distress. I think that one point in the early diagnosis is, as Dr. Judd mentioned in one case, that the distress would shift about. We all know from our physiology, if we stop to remember it, that the content of the bowel is fluid in the cecum and that as the material moves around more slowly it gets more and more hard and dry; so, in some of the cases, palpation of the abdomen will show that the content of the descending portion is fluid, whereas, normally, it is not fluid. Another point in diagnosis is trying to put the patient on accurate bowel management, to have him on such diet that the bowels will move without taking cathartics. In this way a lot of patients who have these attacks will have their supposed gallbladder trouble clear up. They will have so much distress with an attack that they will be afraid to eat large meals, or it may be that they will find that greasy foods are causing their distress, which is considered a point in favor of their having disease in the gallbladder. In these types of cases I think the thing to do is to put the patient on accurate bowel management and get the bowels working without taking cathartics. If they clear up it speaks against gallbladder disease. Of course, there are other things to take into consideration, such as the leucocyte count and temperature; but many of these bowel cases may have a slight rise in leucocyte count and this may help to confuse one. I have seen gallbladders after they have been removed and have heard the surgeon say, "I expected to find definite pathology in this gallbladder as the patient had a fairly definite history of gallbladder disease." Then, when you have asked him about the patient's bowel history, use of cathartics, etc., he will admit he knows nothing about it, having apparently not inquired into this part of the history. In some cases, when you go back and inquire from the patient, you will get a history of long-continued and frequent use of cathartics. At least some of these patients have their distress from an irritable bowel resulting from the use of cathartics and enemas. These, I believe, are the type of patients who, having been operated upon, will say sometime afterwards that they are having their old gallbladder distress, even though their gallbladders have been removed. It is admitted that many of the patients with gallbladder distress will have used cathartics and that their distress may be due to their gallbladders, even though they have used cathartics, but my point is that many of them have their distress from the abuse of cathartics and

enemas and that, therefore, the attempt should be made to establish that fact and avoid unnecessary and, consequently, disappointing operation.

DR. H. B. SWEETSER: The last statement made by Dr. Cameron as to the time of formation of new stones in the gallbladder is open to some question. It reminds me of a patient I operated on some years ago. He had acute cholecystitis with stones. The gallbladder was emptied of stones and drained. A few days later he died. At the autopsy stones were found in the hepatic duct and far up in the ducts of both lobes of the liver. It is easy to imagine that some of these stones could have reached the gallbladder if the patient had lived, and we might have interpreted their presence as an example of new stone formation.

Dr. Strachauer has said he has never seen a case of acute cholecystitis die, and that operation should be deferred till the acute symptoms have subsided. I have seen them die. Only last September, my chum in the medical school died following rupture of his gallbladder. He was taken suddenly sick on a Sunday with acute inflammation of the gallbladder, and was so sick that operation was postponed to allow of subsidence of the acute symptoms. The following two days he appeared better, but on Wednesday the gallbladder ruptured and on Saturday he was dead, notwithstanding a late operation. I cannot understand why we should continue the old idea that there is more danger in operating during the acute stage than in waiting. Years ago the same positive statements of increased danger were made during discussions as to the safest time to operate in acute appendicitis, but no one now delays operation in this disease. I am sure that my gallbladder cases with fever and a high leucocyte count stand a better chance from early operation than from procrastination. When the gallbladder is exposed, one may then decide whether to excise it or be content with simple drainage.

I was very glad to hear Dr. Judd's case of jaundice due to stricture of the bile duct, in which he was sure no injury had been done to the duct at the time of operation, since bile was present in the stools at first. I had a very similar case which caused me much worry. My patient also passed normal colored stools for a few days, followed by jaundice which deepened and with clay colored stools. Later I made an anastomosis between the common duct above the stricture and the duodenum. I also am sure the duct was not injured at the operation.

This has been a very enlightening and instructive paper which Dr. Judd has presented, the more so from the fact that he has elected to tell us of some of his discomfiting experiences rather than of his many successes.

DR. R. E. FARR: I have enjoyed the paper and the discussion very much. I wish to call attention to a number of points and to especially stress some that have been made. I am glad to find surgeons changing their attitude toward the blind abdominal exploration. I have insisted for years that pathology which could be detected by this method could almost always be anticipated by a well-taken history, a good physical examination and properly correlated laboratory data. I recently heard Drs. Crile, Deaver and W. J. Mayo state that they had frequently removed gallbladders which contained stones they were unable to palpate.

The next point I want to mention relates to what we have termed the physiological test. We believe we have proven in a comparatively large number of cases that it is possible to reproduce the patient's pre-operative symptoms by squeezing or making traction upon the suspected viscus, i. e., gallbladder, appendix, ovary, et cetera, in the patient. Lowen has, by blocking the nerves supplying the appendix or gallbladder, been able to relieve the patient's pain, thus receiving great aid in diagnosing between appendicitis and cholecystitis.

Dr. Judd in his message tonight has called attention to what might be called "freak" cases. It must be from a large series of gallbladder cases that so many unusual conditions have been found. I have had considerable trouble in some of my gallbladder work, but it has been as a rule most satisfactory.

I agree with Dr. Sweetser that it is entirely possible that the gallstones found in Dr. Cameron's case formed in one of the hepatic ducts and were present when he opened the gallbladder the first time. I have in a number of instances, after completely emptying the gallbladder and draining it, found a number of gallstones upon the dressings after the removal of the tube. I would like to ask Dr. Judd if he has not had the same experience. I do not see that Drs. Cameron and Strahauer have proven their point that these gallstones formed during the period between his first and second operation. In relation to the length of time it takes gallstones to form I had an opportunity to make an important observation. Many years ago, while taking care of a man for typhoid fever he developed an acute attack of cholecystitis. He afterwards insisted that this was his first attack. Ninety days after the onset of this attack I performed a cholecystostomy upon him on account of recurrent colics. As the gallbladder was sponged out with gauze numerous small gallstones were removed. From these pure cultures of typhoid bacilli were obtained. As he had never had typhoid fever before it seemed reasonable to assume these stones had been ninety days in forming. However, if Dr. Cameron's reasoning is correct, the stones in his case were developed four days earlier than in mine.

DR. JUDD, closing: Dr. Strachauer and Dr. Farr have both emphasized one of the points I wished to make in this discussion—that gallbladder surgery, as a rule, is extremely satisfactory.

Each of the cases I presented here tonight illustrated some point about which we are not entirely decided. By studying cases in this way, we should be able to improve our results, though I believe the outcome is satisfactory in 90 per cent of the cases.

Dr. Farr asked me whether I had ever found stones on the dressings in cases where no stones were found at the time of the operation. I have had this experience, and of course, I have always been in a quandary as to what part of the biliary tract the stones came from.

Dr. Cameron's report brought up a most interesting point—the length of time necessary for gallstones to form. When I first heard the report I felt that he had not emphasized the methods and detail of the examination of the gallbladder at the initial investigation. This case suggests the rapidity with which stones may form.

HYPERTENSION IN PREGNANCY*

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For many years it has been deemed advisable to make routine examinations of the urine during pregnancy. More recently, especially in the last fifteen years, considerable attention has been given to the routine observation of blood pressure during pregnancy. The purpose of these two methods of examination is to detect disease conditions before the mother and her unborn child have been seriously injured by the inroads of disease. The pathologic conditions with which we are particularly concerned are the toxemias of pregnancy. Inasmuch as we are in ignorance of just what these conditions are, we are unable to tell whether we are dealing with one or several disease conditions. We know something of the pathology in the cases which terminate fatally. We know little of the effect of these disease conditions upon the subsequent life of the patient. A careful study of the blood pressure of pregnant women may not only help us to protect the individual from the ravages, but also throw some light on the problem, of the toxemias of pregnancy.

We should guard against the consideration of blood pressure as an isolated condition in any case and especially in pregnant women. We know relatively little of the significance of blood pressure. Hypertension presents many unknown factors and unless extreme or associated with other abnormal conditions its significance in a given case should be determined only after careful scrutiny of other factors in the case. In pregnancy, hypertension is a finding of considerable importance because of its well known association with the toxemias of pregnancy. Much has been written concerning high blood pressure in pregnancy, but aside from showing its almost constant association with the eclamptic toxemias, little has been done to determine the real significance of hypertension during pregnancy.

So far as the literature goes, very little attention was given to blood pressure in pregnancy toxemia prior to 1907. Partridge in articles written in 1903 and 1907 made no mention of the use of blood

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pressure readings in the diagnosis of this condition. Allen in 1905 quoted Kroenig to the effect that eclampsia is accompanied with high blood pressure. He also quoted Richardson, who estimated the maximum blood pressure in a case of eclampsia at 208. Allen considered it to be an impractical method of diagnosis. He thought digital compression might give some information of value as to the amount of tension.

Vogeler in 1907 reported a series of fifty cases with observations during labor. He considered all cases with a pressure below 100 to be hypotension. The hypertension cases he grouped into moderate, under 180, and extreme, above this figure. Vogeler drew the following conclusions:

1. Normal blood pressure during pregnancy is 100 to 150 mm.
2. The pressure is higher during labor, but any postpartum pressure above 150 mm. or below 90 mm. is abnormal.
3. Hypotension less than 90 mm. indicates hemorrhage.
4. Hypertension above 150 needs watching.
5. Hypertension 150 to 180 is incompatible with completion of full term pregnancy and labor.
6. Marked hypertension over 180 is a grave symptom.
7. Hypertension with convulsions is an absolute indication for emptying the uterus.
8. Marked hypertension persisting in spite of treatment in connection with edema and cerebral symptoms is dangerous even without convulsions. Termination of pregnancy is indicated.

Skeel (1909) thought the normal pressure was about 130 during pregnancy. A pressure of 160 to 180 does not exist in normal pregnancy. He considered the absence of albumen or a trace of albumen to be of no value in determining the existence or non-existence of toxemia. A progressively increasing quantity of albumen indicates trouble. For this reason he believed that blood pressure observations during pregnancy have an increased importance. Digital compression to determine arterial tension is of no value. Any blood pressure in excess of 150 mm. during pregnancy is abnormal. Blood pressure may be somewhat elevated during labor, but should become normal subsequent to labor. Blood pressure is elevated in both eclampsia and pre-eclampsia.

Bailey (1911) considered the average blood pressure in the last weeks of pregnancy to be 118 mm.

A blood pressure rise over 150 mm. requires investigation. In eclampsia blood pressure is about 200. It may be as low as 155. Convulsions are not apt to occur when the blood pressure is lowered by a poor resistance or drugs. He thought treatment should not be directed especially toward the reduction of the blood pressure.

Judd (1912) wrote that hypertension in itself may require treatment. He thought that eclampsia may be foreseen by blood pressure observations. Hypotension may foretell shock or concealed hemorrhage. He believed the gravity of the case may be determined by the height of the blood pressure and the amount of serum albumen and serum globulin in the urine.

Lynch in 1913 analyzed one hundred private cases. He found only 8.2 per cent with a blood pressure between 121 and 145. He quoted Davis' figures of blood pressure readings in sixty cases during the puerperium, of which 25 per cent had a blood pressure between 131 and 140; it was over 140 in 4 per cent of these cases. He found no relationship between the blood pressure and the percentage of albumen. He reported two cases of eclampsia with very slight if any elevation of blood pressure.

Malcolm Donaldson in 1913 found a uniformly high systolic pressure in a series of cases with albuminuria. In toxic cases the blood pressure tends to fall quickly to normal following delivery. He considered a rising blood pressure to be an indication for the termination of pregnancy.

Hirst (1915) considered hypertension to be more significant of late toxemia than urinary or other changes. He believed that the ordinary systolic pressure of eclampsia is 180. In severe cases it is apt to be over 240. The blood pressure is apt to remain high for ten days or more after the disappearance of other symptoms. He advocated the lowering of blood pressure by sweating, purgation, *veratrum viride*, rupture of the membranes, and venesection when it is above 180.

Barnard thought that any blood pressure rise above 140 is abnormal. In his series of 200 cases, 18 had a pressure of 140 to 225. All of these cases had albuminuria. All his eclamptics except one had a marked elevation of pressure. This was 145 until after delivery.

Riesman (1915) was of the opinion that blood pressure readings during pregnancy are of par-

ticular importance. He mentioned three forms of hypertension: (1) associated with nephritis; (2) accompanying arterio-sclerosis; (3) a mysterious form occurring in middle age without apparent renal involvement.

Newell (1915) reported 450 cases. He said that many women show a temporary rise in blood pressure during pregnancy. Five of his patients had a blood pressure of 140 or over. He considered the rise in blood pressure to be an indication of possible toxemia even in the absence of other symptoms. He thought that the age of the patient did not influence the blood pressure during the child-bearing period. He believed that there is a tendency toward an increase of blood pressure with each subsequent pregnancy.

Litzenberg gave an analysis of blood pressure in 524 cases. About 20 per cent had a rise above 130. The diastolic pressures give no more information than the systolic, though a relatively high diastolic pressure may be of significance. About 11 per cent of his cases showed a diastolic pressure above 86. Dr. Litzenberg stated that about 3 per cent of the patients with a systolic pressure between 130 and 140, about 9 per cent of those between 140 and 150, one-third of those between 150 and 160, one-half of those between 160 and 180, and practically all with a pressure over 180, have toxemia. Albuminuria occurred without hypertension in about 31 per cent of his cases, and hypertension without albuminuria in about 46 per cent of them. Irving found hypertension occurring before albuminuria twice as frequently as albuminuria preceding hypertension. Eclampsia may occur without hypertension.

Danforth reported 115 private cases. He thought that the average pressure of the pregnant woman is less than that of the non-pregnant. He believed that labor causes a rise in blood pressure, and that toxemia of pregnancy is accompanied by hypertension except in rare instances.

Warfield (1919) divided hypertension cases into subacute and chronic. He thought that in some individuals it is a normal condition and that it runs in families and may be hereditary. He believed that in itself it is not dangerous and does not represent a pathologic process. He stated that no obstetrician does his full duty if he fails to take blood pressure frequently during the last half of pregnancy. He considered three types of chronic hypertension: (1) the chronic interstitial nephrit-

ic; (2) the essential or hereditary; (3) the arterio-sclerotic. Each of these have different grades and may occur in combination.

Schulze (1920) reported a series of fifty cases from the fourth to the ninth month of pregnancy. He estimated the average pressure to be slightly higher for the latter months of pregnancy. He found that the average of 75 readings at term was 123, of 86 readings in the second stage to be 133, of 104 readings three hours postpartum was 120.

Kosmak in 1922 quoted Zangmeister to the effect that edema of the brain is associated with high blood pressure in eclampsia. He considered that the lowering of the blood pressure by venesection tends to reduce the convulsions, and the tendency to edema and hemorrhage of the brain.

De Snoo (1922) agreed with the theory of Bar that there is a close relationship between high blood pressure and sodium chloride retention. He emphasized the importance of treating his pre-eclamptic and eclamptic cases with a salt-free diet. He divided his hypertension cases into three groups: (1) previously healthy women with normal blood pressure who again become normal after delivery; (2) women with latent or chronic nephritis having hypertension; (3) women with primary hypertension. In *Group I* the cases have sodium chloride retention leading to edema. The long standing retention of sodium chloride leads to albuminuria and hypertension. He considered hypertension to be the most important sign of threatened eclampsia. He quoted cases of eclampsia developing without other signs than hypertension. He knows of no cases of eclampsia without hypertension. In this group of cases the blood pressure returns to normal in about fourteen days. Persistently high blood pressure indicates latent or chronic kidney disease. *Group II* (nephritic). These cases do quite well the first half of pregnancy. Hypertension develops in the second half associated with headache, albuminuria, tendency to bleed, and visual disturbances. According to his view, eclampsia occurs almost exclusively in primiparae and it is not apt to recur. There is a tendency to recur in the nephritic type. In this group the blood pressure drops to its usual level about fourteen days postpartum. *Group III* (primary hypertension). This represents a small group of cases. There is no toxemia in these cases. There is no increase in blood pressure during pregnancy. The pregnancy proceeds without complications.

The hypertension in itself might lead to placental hemorrhage and its premature detachment. Out of 31 women with premature separation of the placenta, 22 had hypertension, 18 of the 22 had normal urine. He stated that the best treatment for hypertension cases is rest and salt-free diet. When the blood pressure returns to normal, even with albuminuria, he thinks the pregnancy may be allowed to continue. Repeated venesection has in his hands been without material result, producing only a temporary drop in pressure. He thinks that every pregnant woman with hypertension even without other symptoms should have rest in the latter months of pregnancy.

It is readily seen from the above review of the literature that blood pressure observations during pregnancy have assumed an importance equal to if not greater than the routine urinary examinations. The almost constant association of hypertension with toxemia is well established. It is also definitely recognized by a few that the so-called eclamptic toxemia is not the only cause of hypertension during pregnancy. The problem of hypertension is difficult to unravel because of the numerous factors which enter into its production. It becomes still more complicated because we may have combinations of conditions operating in individual cases. This is particularly true during pregnancy. A normal healthy woman who is pregnant may develop an eclamptic toxemia with hypertension. A woman with hypertension may become pregnant and go through the period of gestation without complications. She may, however, have an eclamptic toxemia superimposed on her pre-existing hypertension. Another woman with a nephritis and an associated hypertension may pass through pregnancy without serious aggravation of the previously existing condition. She may, however, have an exacerbation of the nephritis or develop an eclamptic toxemia superimposed upon the previously existing nephritis and hypertension. These different possibilities must be considered in evaluating the symptoms and findings in any case. Necessarily the opinion formed regarding the condition or conditions present modifies one's judgment as to the proper course to pursue. It is apparent that the hypertension present at the time of observation cannot be the only factor which influences our decision. Antecedent blood pressure observations are of the greatest assistance and one should never

make a judgment on hypertension alone, especially when only one observation has been made.

In order to clarify somewhat the situation regarding blood pressure observations during pregnancy, I have selected a short series of cases which I wish briefly to report together with their blood pressure curves. These observations are not perfect nor as complete as one might wish, but do, I think, bring out certain points of value. Before, however, proceeding with these individual cases I should like to report the blood pressure findings in a series of 38 cases of eclampsia admitted to the Minneapolis General Hospital. These cases were analyzed by Dr. Collier of the resident staff. Of these cases, about 79% were primiparæ, 21% multiparæ. The average age was 25.7 years. The youngest was 17 and the oldest 45. The average blood pressure on admission was 182 systolic and 110 diastolic. On discharge the average blood pressure was 121 systolic, diastolic 72. Of these patients about 18% had no convulsions; 37% had convulsions before and after delivery; 29% had convulsions before delivery, and 16% after delivery. The average stay of these patients in the hospital was about 19 days. About 79% of the patients lived. About 16% died from eclamptic toxemia, and about 5% died from complications.

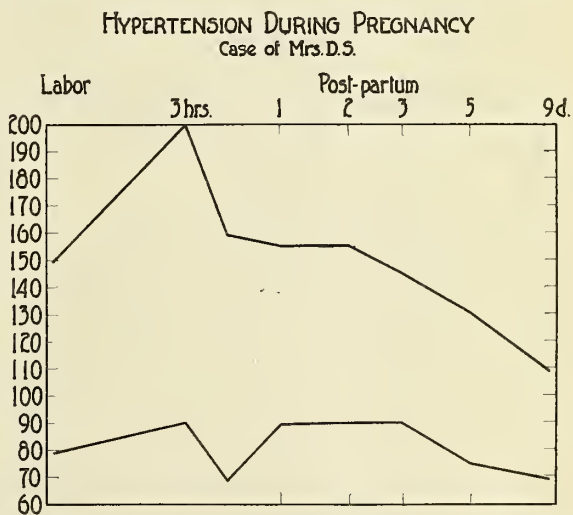


Fig. I, Case I.

Graph of blood pressure readings.

We will now proceed to show the blood pressure findings in a few illustrative cases. These cases represent different types and in some the blood pressure findings extend over a period of several years; and perhaps will give an idea of what ultimately happens in these cases, not only

in one pregnancy, but in successive pregnancies. It would be much more valuable, of course, if one could follow these cases with rather complete observations for a considerable portion of their lives, but naturally that is very difficult to accomplish. Some of these records have been compiled not only from my own personal observations, but from the records of other physicians. Most of them are private cases and could, therefore, be followed a little longer and perhaps more closely than those who enter the charity wards of general hospitals.

Case I. Mrs. D. S. Age: 19 years. Para I. Grav. I. She had had headache and abdominal distress of dull type all during pregnancy. She was admitted to the Minneapolis General Hospital on January 27, 1922, and was in the hospital for ten days, being discharged on February 6, 1922.

Diagnosis: Parturition O.D.A. Eclampsia—Puerperium.

She was delivered at 12:50 P. M. on January 27, 1922. Convulsions started at 3:30 P. M. Before delivery the blood pressure was 148/78, and at 3 P. M. it went up to 200/90. Edema showed up after the second stage, at which time there was edema of both ankles. There had been no edema up until this time. There was a rapid rise in blood pressure. She had three convulsions that afternoon.

The urine before delivery showed a faint trace of albumen, no sugar or casts, specific gravity was 1023. After delivery there was a large amount of albumen, no sugar or casts, and the specific gravity was 1020.

numerous casts. The epigastric pain occurred at about 11:30 P. M., at which time she also vomited. At 6 A. M. she had a convulsion which lasted ten minutes. A Caesarean section was done at 11:30 A. M., May 29, 1916, before which time she had had three convulsions. She was delivered of a viable child. A hysterectomy was also done because of numerous fibromyomata. On June 17, 1916, she was still having considerable headache. There was no disturbance of vision. On June 20, 1916, a diagnosis of cystitis was made. She made an uninterrupted recovery. She was seen again in October, 1916, at which time the blood pressure reading was 104/68-78. She was later seen in May, 1917, one year after the birth of the child, at which time she was feeling well. The baby's general condition was also good.

HYPERTENSION DURING PREGNANCY Case of Mrs. R.W.C.

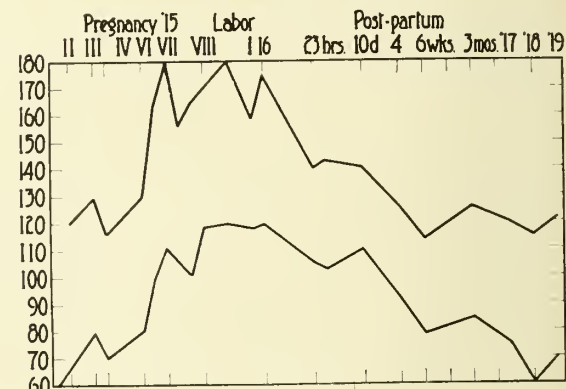


Fig. III, Case III. Graph of blood pressure readings.

Case III. Mrs. R. W. C. Age: 26 years. No acute illnesses. Weight 105 pounds. No hypertension.

She was first seen in 1915, at which time she was a little over two months pregnant. She had marked nausea and vomiting with pyrosis and salivation. About four and one-half months later she developed edema, epigastric distress with hypertension and albuminuria. She was treated expectantly in the hospital and delivered of twins about one month later. Labor was induced and she had convulsive attacks. She made a good recovery.

Over a year later she had another pregnancy, with vomiting and albuminuria, for which she had a therapeutic abortion. Subsequently she developed a pyelitis.

About nine months later she had another pregnancy with hyperemesis, albuminuria, and convulsions in the third month of gestation, for which the uterus was emptied.

Two years later she had another pregnancy with hyperemesis for which a therapeutic abortion was done.

About nine months later she had an appendectomy.

Case IV. Mrs. G. J. B. Age: 34 years. She was first seen in 1914, at which time she was about four months pregnant. She had two previous pregnancies with miscarriages. She had no acute illnesses except a suppurative otitis media two years before. Her physical condition was good, except for an acute attack of appendicitis. She developed an acute tonsillitis and operation was deferred until about two weeks later when an appendectomy was done.

HYPERTENSION DURING PREGNANCY Case of Mrs. L.M.S.

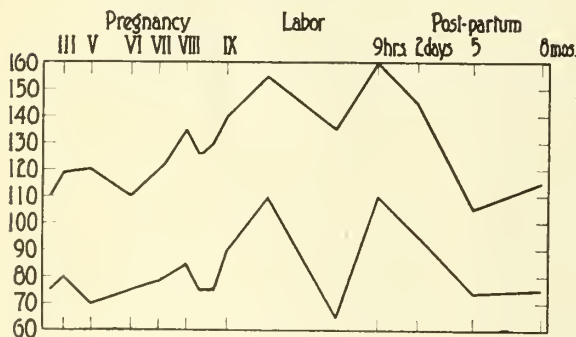


Fig. II, Case II. Graph of blood pressure readings.

Case II. Mrs. L. M. S. Age: 37 years. The patient was first seen in July, 1915. She had had measles in childhood. She consulted me on account of sterility. Her physical condition was good. She next consulted me on November 9, 1915, at which time she was 2½ months pregnant. Early pregnancy was uneventful except for an attack of possible appendicitis in November. She had no headache or edema. She felt well in January, having no headache or edema. There were no untoward symptoms in February. About the ninth month she suddenly developed epigastric pain and edema with hypertension and marked albuminuria and

The urine showed no important findings. She had slight hypertension. She felt well and had no edema until about January 26, 1915. Her hands were somewhat puffed. On February 6, 1915, she had a little headache. There was edema of the hands and feet. On this day she was sent to the hospital. About this time she developed a slight albuminuria with a few hyalin casts. She had very marked edema, and marked eye signs. Fundal examination of the eyes showed no demonstrable lesion. Labor was induced on March 1, 1915. On March 3, 1915, she was delivered of a still-born child. After the delivery the patient was dizzy and had some trouble with vision. The placenta was retained, but came away on the sixth of March, three days after delivery. On the twentieth of March the patient left the hospital, her general condition good, but she had some difficulty of vision.

Case V. Mrs. M. Z. Age: 30 years. Para I. Grav. II. Diagnosis: Parturition O. L. A. Toxemia of pregnancy. Eclampsia of parturition.

She was admitted to the Minneapolis General Hospital on January 6, 1922. She appeared confused. She had three convulsions and considerable edema. The blood pressure at this time was 164/110, and the urine showed a large amount of albumen with a few casts. She was delivered at 3:45 p. m. and at 8:55 p. m. she had another convulsion. She was still irrational the next day and there was a good deal of edema. Two days later she had a severe headache and some edema. Five days after delivery she had a typical eclamptic convulsion. At this time the urine showed a moderate amount of albumen with very many casts both hyalin and granular.

HYPERTENSION DURING PREGNANCY Case of Mrs. G.J.B.

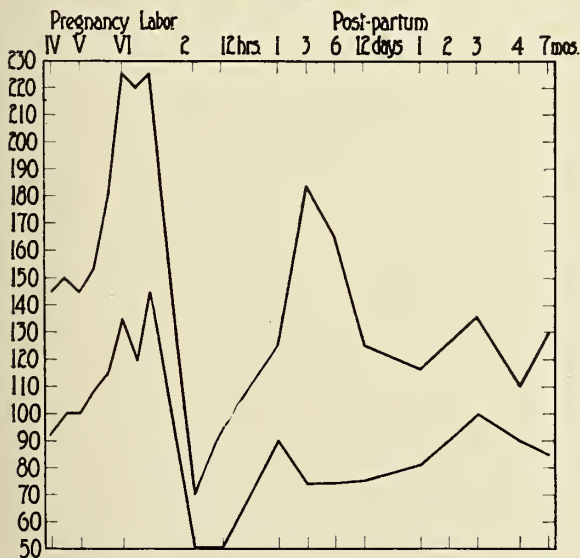


Fig. IV, Case IV. Graph of blood pressure readings.

Case VI. Mrs. C. Age: 23 years. She was admitted to the University Hospital on October 12, 1921, and was discharged December 17, 1921. Diagnosis: Pregnancy abnormal O. L. P. Acute nephritis of pregnancy.

At the time the patient was admitted to the hospital she

was seven months pregnant. She had had no miscarriages. There was no venereal history. She had frequent tonsillitis and quinsy. Upon admittance to the hospital, fluid was found in the abdomen and pleural cavities. There was edema of the hands, feet, ankles, legs, thighs, and face.

HYPERTENSION DURING PREGNANCY Case of Mrs. M.Z.

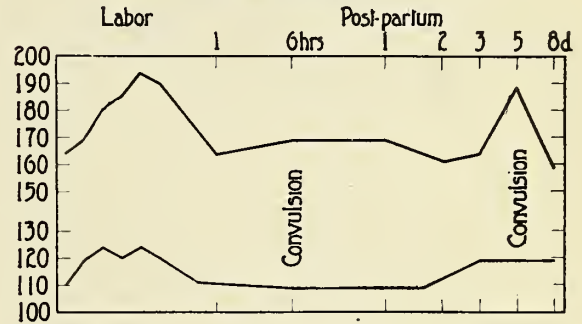


Fig. V, Case V. Graph of blood pressure readings.

This had been progressive since October 17, 1921. She had albuminuria, headache, blurring and spotting, scotomata, and hypertension. She had felt well until about one week before admission. She was kept under observation for a month, the edema increasing all the time. She was delivered on November 14, 1921, of a living baby, after induction of labor.

When the patient entered the hospital she showed a four plus albumen. This continued four plus until delivery, then there was a large trace and a very large trace. The specific gravity varied from 1.017 to 1.016. There were hyalin and granular casts on admittance, and occasional casts afterward. There were none for several days before delivery.

On March 30, 1923, she was again admitted to the hospital. Diagnosis: Toxemia of pregnancy. There was no nausea or vomiting with this pregnancy. There were no convulsions. The urine showed a large amount of albu-

HYPERTENSION DURING PREGNANCY Case of Mrs. Ch.

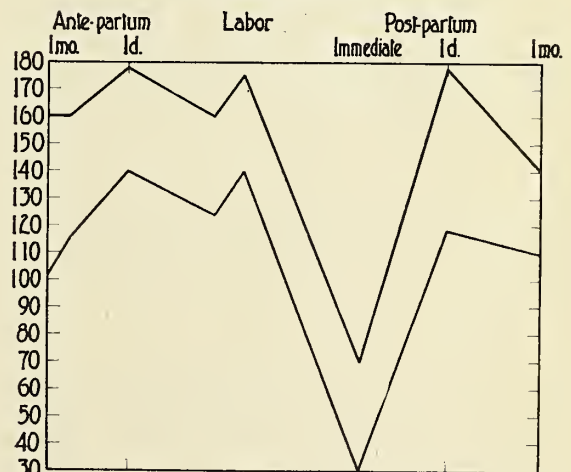


Fig. VI, Case VI. Graph of blood pressure readings.

men, carrying from two to three plus. Blood pressure varied from 140 to 180 systolic and 90 to 110 diastolic. Labor was induced at the eighth month and she was delivered of a living infant.

HYPERTENSION DURING PREGNANCY Case of Mrs. R.D.M.

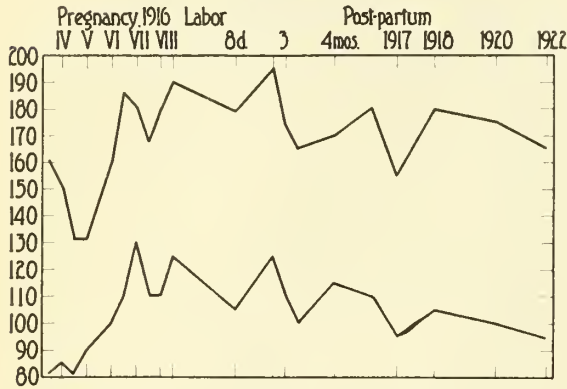


Fig. VII, Case VII. Graph of blood pressure readings.

Case VII. Mrs. R. D. M. Age: 36 years. She was first seen on February the fifteenth, 1916. She had had measles, scarlet fever, and typhoid fever. This was the third pregnancy. The first pregnancy resulted in still-birth after induction of labor for eclamptic toxemia. The second pregnancy resulted in a miscarriage at the third month.

When first seen the patient was in good health. There was little evidence of organic disease. The urine showed nothing of importance. She had some hypertension. She was first seen about the fourth month of pregnancy. About the seventh month she developed considerable edema, but no subjective symptoms. At this time she had plus albumen in the urine. She was sent to the hospital and kept on rest and diet. Labor was induced about ten days later. She was delivered of a viable child. She has been in fairly good health. There have been no subsequent pregnancies.

In 1917 blood chemistry: Nitrogen 32; urea 36; creatinin 1; uric acid 3.1; glucose .079. P. S. P. test was 70% in two hours. Day urine was 726 c.c. sp. gr. 1005 to 1027. Night urine 308 cc., 8 grams of sodium chloride excreted 7.1. Intake of thirteen grams of nitrogen excreted 8.2. The urine showed a faint trace of albumen, and a few hyalin and granular casts. A diagnosis of possible glomerulo-nephritis was made.

In January, 1920, her blood pressure was still high. In November, 1920, her blood pressure was 175/102. She complained of her joints being swollen. In January, 1922, she was feeling quite well. At this time her blood pressure was 164/94.

Case VIII. Mrs. G. B. F. Age: 41 years. Para III. Grav. V. Of the four previous pregnancies, two were somewhat premature, one at term, and one miscarriage. There was no history of toxemia. She had had measles, but no other acute infections.

When first seen on February 10, 1921, she was in the

second month of pregnancy. At this time she had a slight hypertension. Her body weight was 205 pounds. The urine was negative until the six month, at which time there was a faint trace of albumen. The urine never showed more than a trace of albumen, no casts, and only a few pus cells.

She later developed hypertension, had marked edema, some headaches, scotomata, tendency to dyspnea, and stiffness of the joints. She improved very little under rest and diet.

Labor was induced with a Vorhees bag on July the twentieth. She was delivered of a premature viable infant about five hours later. Her subsequent health has been quite good.

Case IX. Mrs. J. B. Age: 38 years. She consulted me on September 14, 1920, because of apparent sterility.

HYPERTENSION DURING PREGNANCY Case of Mrs. G.B.F.

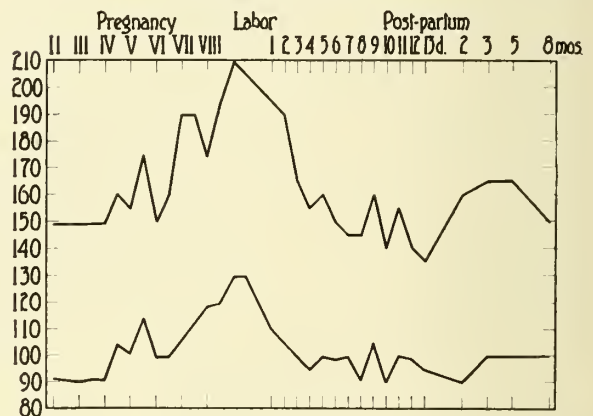


Fig. VIII, Case VIII. Graph of blood pressure readings.

She gave no history of a high blood pressure. She had chicken pox and measles in childhood, flu pneumonia about one year previously. When first seen her physical condition was good. She was next seen about five months later when she was about 2½ months pregnant. At this time she had slight hypertension. Fetal life was felt April the fifteenth. On May the twenty-seventh she was in the hospital under rest and diet with some improvement. Blood chemistry: Bld. sugar .15; creatinin 2.2; urea nitrogen 18.2; uric acid 1.6; alkali reserve 59.7; sodium benzoate 86%. Her weight was about 167 pounds. The urine never showed more than a faint trace of albumen, no casts, and very few pus cells. She had marked edema and some epigastric distress. She left the hospital after two weeks' time. Fetal heart tones were not audible when she left. Her condition while in the hospital improved. She returned to the hospital four days later and was delivered of a macerated fetus. She left the hospital in a good condition on June 23, 1921.

She was again seen on September 9, 1921, at which time her general health was good. At this time her blood pressure was 140/94. In November, 1921, at which time I again saw her, she was feeling quite well. She had noticed some puffiness of the hands. At this time her blood

pressure was 150/90. In November, 1922, her blood pressure reading was 152/98.

Case X. Mrs. E. M. L. Age: 31 years. The patient was first seen on April 14, 1914. She had had measles and was subject to tonsillitis. A diagnosis of pregnancy and exophthalmic goitre was made. This was the first pregnancy. There was no edema, headaches, or blurring. She was seen again on May 12, 1914. At this time there was some shortness of breath, but no headaches or edema. She was again seen on June 15, 1914. At this time there had been some headache the last few days, but no edema or visual disturbance. In August she began to have some dizziness and blurring of vision, but no headaches or edema. In September she had some swelling of the feet, but none of the face. There was some blurring of vision the latter part of the month, and some epigastric distress. Albuminuria appeared about the beginning of the eighth monthly, shortly before delivery. She was delivered on October 12, 1914, of a premature infant, precipitately. She had some trouble with her stomach after the birth of the baby.

She was seen again on May 20, 1920. At this time the blood pressure was 158/98-100. On March 8, 1922, she was again seen, at which time a diagnosis of Bartholinian cyst, cystic ovary, hypertension, and goitre was made. The blood pressure reading was 164/108. She was seen again February 27, 1923, at which time the blood pressure was

three months pregnant. She had had typhoid, pneumonia, scarlet fever, tonsillitis, and attacks of upper abdominal colic with jaundice. She had had high blood pressure for over a year. She also had severe headaches. A diagnosis of pregnancy and arterial hypertension was made at that time. About three months later she developed intense head-

HYPERTENSION DURING PREGNANCY

Case of Mrs. E.M.L.

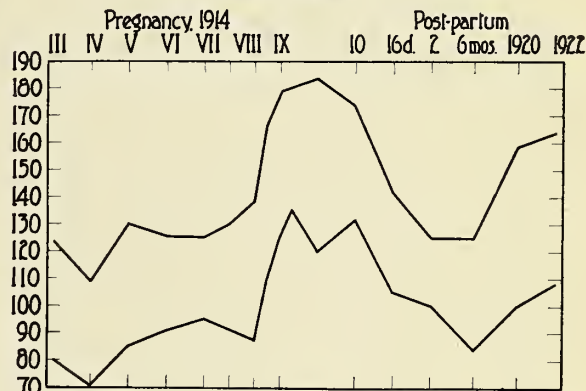


Fig. X, Case X. Graph of blood pressure readings.

ache, vomiting, puffed facies, marked hypertension, and blurring of vision. On the first of August she had intense headache and vomited some. Her face appeared somewhat puffed, although there was no definite edema. Labor was induced on the fifth of August and she was delivered of a macerated fetus.

When the patient was first seen the urine was negative. On July 31, 1916, there was a four plus albumen, which fell to two plus on September 28, 1916.

She was again seen in 1917 when about two months pregnant. She was delivered about five months later of a male child. With this pregnancy she developed albuminuria, some headache, but no edema or visual disturbance. There was marked hypertension. Subsequent to this pregnancy she had functional kidney tests which were normal. She

HYPERTENSION DURING PREGNANCY

Case of Mrs. J.B.

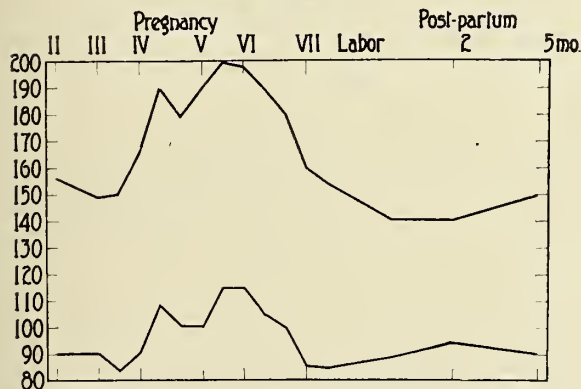


Fig. IX, Case IX. Graph of blood pressure readings.

136-138/102. On March 9, 1923, she was operated and the cyst removed. She made an uneventful recovery and was discharged from the hospital in good condition.

Case XI. Mrs. E. A. C. Age: 25 years. She was first seen on September 30, 1921, at which time she was about $3\frac{1}{2}$ months pregnant. This was the first pregnancy. She had only a faint trace of albumen in the urine. This continued all through pregnancy. She had no edema or headaches. When first seen the blood pressure was 156/80, and about four days before delivery it was 170/110. Labor was induced, and she was delivered of a viable child in March, 1922.

Case XII. Mrs. L. M. C. Age: 34 years. She was first seen on April 21, 1916, at which time she was about

HYPERTENSION DURING PREGNANCY

Case of Mrs. E.C.

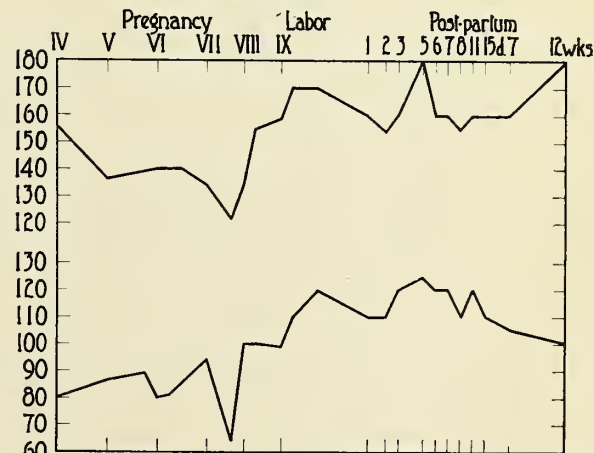


Fig. XI, Case XI. Graph of blood pressure readings.

was at Rochester in November, 1917, at which time the blood pressure was 210/138. She had a two plus albumen, a small number of pus cells. Combined phthalein test was 60% in two hours. There was beginning albuminuric retinitis with a few small hemorrhages in the retina. She was advised the removal of the tonsils.

HYPERTENSION DURING PREGNANCY Case of Mrs. L.M.C.

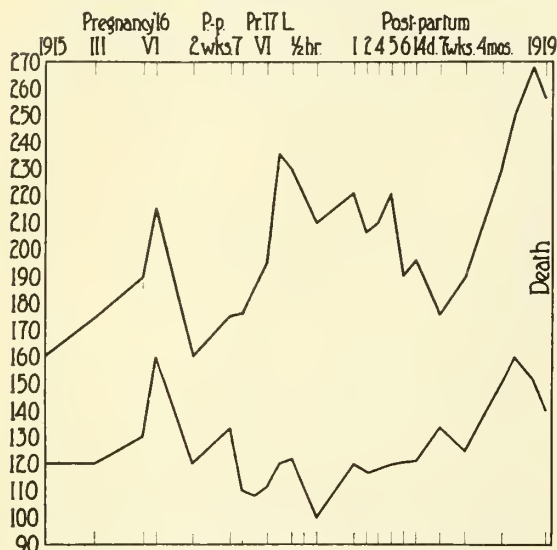


Fig. XII, Case XII. Graph of blood pressure readings.

In October, 1919, Dr. H. L. Ulrich found the blood chemistry to be practically normal. P. S. P. was 48%. The Mosenthal Diet: Day urine, 914 c.c. sp. gr. 1010-1020. Night urine, 690 c.c. sp. gr. 1014. She became much worse in November and entered the hospital in a uremic condition. At this time there were large amounts of albumen and many casts. A urea nitrogen of 82, uric acid 15, creatinin 2.5, blood sugar .33. She was nauseated, vomited, had convulsions, and marked nervousness. Her blood pressure reading at this time was 268/152. She died in November, and partial autopsy showed an arterio-sclerotic kidney.

SUMMARY

1. The routine taking of blood pressure readings is very important in the detection and diagnosis of pathologic conditions, especially eclamptic toxemia, during pregnancy.

2. An increase of blood pressure during pregnancy practically always means the existence and progression of some pathologic condition.

3. The presence of a hypertension during pregnancy is not in itself necessarily a serious condition.

4. The causes underlying a hypertension in pregnancy are usually important and are apt to become aggravated during the pregnancy and with each subsequent pregnancy.

5. There are several groups of cases which present hypertension during pregnancy.

6. Eclamptic hypertension is one group which is characterized by an acute hypertension usually followed by a drop to the normal level following confinement.

7. As above, but followed by a persistent though lessened hypertension.

8. An already existent hypertension which does not increase during pregnancy. This form is unusual and makes a second main group.

9. A third main group with an existent hypertension which increases during pregnancy due to the aggravation of the underlying condition, probably a nephritis. These cases are apt to become progressively worse with each successive pregnancy. In some the blood pressure recedes to its usual level, and in others it remains higher subsequent to delivery.

10. The fourth group might include those cases which have an antecedent hypertension upon which an eclamptic toxemia is superimposed. In these cases the preexisting condition may or may not be aggravated by an eclamptic toxemia. In the former instance the blood pressure remains persistently higher as a rule, and in the latter it resumes its usual level.

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DISCUSSION

DR. E. L. GARDNER: Dr. Adair has presented a very interesting and comprehensive paper. Hypertension in pregnancy is one obstetrical subject which is of particular interest to the internist. Dr. Adair has called your attention to the differential diagnosis, some points of which might be stressed.

Eclamptic hypertension is a clinical entity, characterized in the early stages by a more or less variable syndrome

but later very often by a high blood pressure, albumen and casts in the urine and a tendency to edema. Usually there is little or no blood in the urine. The kidney in this case resembles very closely the kidney as seen in cer-

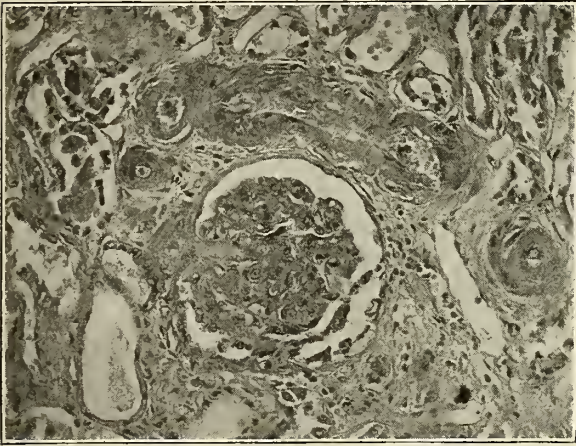


Fig. XIII, Case XII. Photomicrograph showing the characteristic changes in an arterio-sclerotic kidney.

tain degenerations, such as those which follow intoxications, following fevers, mineral poisons, and so on, a condition which we very frequently call a nephrosis to differentiate it from inflammatory changes in the kidney,—inflammatory nephritis. Following labor and the puerperal period or removal of the intoxication, recovery of the kidneys is apparently complete. Possibly a few of these kidneys show some permanent damage, a supposition which is hard to prove.

We may have eclamptic hypertension associated with physical injury, especially glomerular injury. In such cases we are likely to have the eclamptic symptoms increased. Usually there are also some additional symptoms, namely, nitrogen retention, and a tendency to fixation of the specific gravity of the urine. These cases are likely to have a severe albuminuric retinitis and often show a considerable quantity of blood in the urine. After labor the eclamptic symptoms may disappear. However, we always have a residue which is aggravated over what it was before pregnancy or the most we can expect is a return of the kidneys to the condition which was present before pregnancy developed. Acute nephritis developing in pregnancy probably does not clear up entirely; there is nearly always some residue, or scarring, which, however, may not be evident clinically.

My third point is that hypertension (so-called essential hypertension) may be associated with eclampsia. Essential hypertension per se, of course, is not a cause of edema and makes a differential point. However, when the two are associated together the differential diagnosis is more difficult. The symptoms of eclampsia are likely to be increased if renal arterio-sclerosis is present. Such cases have a high blood pressure before and following eclampsia. On the other hand, as Dr. Adair has shown, hypertension cases may go clear through pregnancy without any evidences of eclampsia.

Eclamptic hypertension, glomerulonephritis and essential hypertension may therefore occur in pregnancy and one may occur in association with another. The prognosis depends upon how thoroughly the cases are analyzed and also to a certain extent upon the treatment instituted. We should therefore be very careful not to draw conclusions from insufficient data, that is, just hypertension and albumen.

DR. A. G. SCHULZE: I had the pleasure of reading Doctor Adair's paper yesterday and I made some notes on that part of the paper which he did not read this morning. If I were obliged to follow a woman through pregnancy and resort to blood pressure findings on the one hand or be obliged to resort to urinalysis on the other hand, I think I should take the blood pressure method. It has been found that in those women who show a "trace" of albumen, forty-five per cent develop toxemic symptoms, and in another series of pregnant women who developed what you would call a "large trace" of albumen only fifteen per cent developed toxemic symptoms. Therefore the amount of albumen in the urine seems to be very unreliable as an indication of eclampsia; the blood pressure reading being much better.

What is a normal blood pressure in pregnancy? I am asked that question repeatedly and I tell the patient that there is no such thing as a normal blood pressure, except in so far as you apply it to the patient at the time you take it and under the conditions and circumstances in which you take it. Three years ago, in preparing a paper for the Ramsey County Society on this question of blood pressure during pregnancy I analyzed 210 blood pressure readings taken in 50 women who were pregnant from the fourth to the ninth month, and I found that the average of these readings was 117 millimeters of mercury, which is a little below the generally accepted 120, and that they ranged from 109.5 at four months to exactly 119.5 at nine months, an elevation of ten millimeters of mercury during pregnancy. At no time, from one month to the next, was there a greater increase than three millimeters of mercury over the preceding month.

I also had 75 blood pressure readings taken at the end of pregnancy and before the patient went into labor and the average of those was 123. I had a series of 86 blood pressure readings that were taken, as near as we could determine, in the second stage of labor, and they averaged 133. I had 104 readings that were taken three hours after delivery and found that it had gone back to 120. If a pregnant woman comes to you for the first time and she has a pressure reading of 130 or 135, what does it mean? It does not mean anything in itself because her blood pressure reading before she became pregnant or before you saw her, may have been 150 and now it has come down to 130. It may be that she has been carrying a blood pressure of 130 all her life; or it may have been that earlier in pregnancy her blood pressure reading was 100, 105 or 120. It makes all the difference in the world which way the blood pressure is going, whether it is going up or going down or holding its own.

A few years ago Irving of Boston showed that if the blood pressure remains between 130 and 140 about 3 per

cent of the women would develop toxemic symptoms; if the blood pressure went between 140 and 150, 9 per cent of them developed it; if it went between 150 and 160, 25 per cent developed it; if it went between 160 and 170, 50 per cent of them developed it, and when it reached 180, 100 per cent of them developed it.

The value of blood pressure readings is not in a single individual reading but rather in a series of readings. I take blood pressure readings every time I see my patient as faithfully and systematically as I do urinalysis, and the danger in pregnancy is when it begins to go up. It has been said that if the blood pressure reaches 150 you are getting beyond a normal pregnancy.

The essayist in his paper made some remarks about a postpartum eclampsia being less severe. I used to think so, and yet some of the most severe cases of eclampsia with convulsions have all been postpartum, and I am beginning to doubt whether a postpartum eclampsia is necessarily a simple form. The essayist also said something about a double toxemia developing. I am glad that he mentioned it.

He mentioned a case of fetal death without convulsions. I would like to ask if that fact established the diagnosis of chronic nephritis. Another question I would like to ask is, are convulsions characteristic and diagnostic of eclampsia as opposed to a chronic nephritic condition. The internist brought that point out some time ago and I have been trying to observe it from the point of view of the obstetrician. Another question is the differential diagnosis between eclampsia and chronic nephritis.

DR. ARCHIBALD McDONALD: I have enjoyed reading Dr. Adair's paper, which brings out forcibly the value of the simple procedure of diagnosis. The classification of the convulsive toxemias of pregnancy is not simple, neither is it absolutely definite. We must admit two, if not three, types. First, the exacerbation of a pre-existing chronic nephritis; second, the onset of an acute condition occurring either as an infectious condition, or as the so-called kidney of pregnancy. For both of these types elevation of blood pressure, together with other signs of nephritis, will give ample warning at a time when proper treatment will usually prevent an onset of uremic convulsions.

There is a third type, which I think of as eclampsia. Its etiology is not known, but its occurrence as an entity must be admitted. It may occur in women who have no edema, no albuminuria, and often no marked elevation of blood pressure. The condition frequently clears up with no evidence of permanent kidney lesion and, unlike the nephritic toxemias, does not tend to recur in subsequent pregnancies. It seems to depend upon some temporary disturbance, associated with that particular pregnancy. Possibly a recent attempt to prove an anaphylactic reaction of the mother to the fetal blood, which is assumed to be absorbed through abnormal placenta, may throw important light upon the etiology.

I believe that the premonitory signs, commonly described as pre-eclamptic, are really of more help and value in conditions with the uremic type of convulsion, that true eclamptic convulsions may occur equally often in the

nephritic. In fact, the nephritic changes may and do predispose to true eclamptic convulsions, but there is a distinct type of eclampsia for which we must hope that future work will develop characteristic preconvulsive evidence.

DR. F. J. HIRSCHBOECK: There has always been a great deal of confusion among clinicians regarding the terminology relative to convulsions in nephritis and so called "eclamptic" convulsions. One of the speakers has referred to the three types of hypertension associated with pregnancy: the eclamptic hypertension, essential hypertension and renal hypertension. The differentiation is not as difficult as it may seem. Essential hypertension is relatively rare in women in the child-bearing period, and usually does not develop until the menopause, so that in a pregnant woman with hypertension a diagnosis of primary cardiovascular disease must be made with caution.

I believe the term "eclampsia" is not used as often as it should be used, and in fact it is possible that the convulsions occurring even in renal insufficiency and uremia are eclamptic manifestations and not an evidence of non-protein nitrogen retention.

The true eclamptic has a rather characteristic appearance: his face is florid during the convulsion, usually cyanotic, and in appearance appears to be relatively well before the attack. Chemical studies before the convulsion usually show no increase, or only a very slight increase, in the end products of protein digestion in the blood, and the blood picture, from the standpoint of its individual cellular constituents and hemoglobin, is normal. On the contrary, a patient who is uremic, and who has symptoms of renal insufficiency, is pale, anemic, and looks ill. The blood count is materially reduced, and the blood chemical studies show an increase in the end products of protein digestion. The true uremic does not have convulsions very often, even in the terminal stage, which is characterized more by a twitching of the extremities and muscles, with a gradual deepening coma, and rarely convulsions. The prognosis in eclamptic convulsions is good, if there is no disturbance to a marked degree in the renal function, and is benefited by spinal puncture or venesection, which would have no influence, or which might result in a deleterious effect, in a true nephritis.

DR. J. C. LITZENBERG: In two or three of Doctor Adair's cases he illustrated the significance of blood pressure after the delivery. Something of a drop is the usual occurrence and then a rise to either the height it was before or approaching it. Then a gradual drop or a rapid drop after delivery, and it is of that I wish to speak as indicating something of prognosis. There seems to be some evidence that we can get an inkling of what the ultimate prognosis of the case may be by the rapidity with which the blood pressure drops after delivery.

It is the usual thing in a case with a good prognosis for the blood pressure to drop fairly rapidly in a comparatively short time to a normal reading. There are on the other hand cases in which the blood pressure drops very slowly. It may be considerable of an assumption to say that these are cases in which the kidney injury has been greater than those in which the drop has been more rapid, but I

believe it to be true. It is a blood pressure condition of this kind in which there is always a residue in the kidney referred to by Dr. Gardner. I take it that he meant residue of injury.

As Doctor Bell of the Department of Pathology at the University has emphasized many times, the human kidney has much more tissue than is necessary to sustain life. Therefore, even if the kidney be injured there may be enough normal kidney tissue left for the woman to go on with normal findings. Yet those women, if they become pregnant again, sometimes repeat this hypertension story. Kidney injury in toxemia of pregnancy is a mighty interesting subject to me, I wish we could know more about it. I am convinced through my experience in the last few years that there are some of those kidneys that are permanently injured.

I had one case of eclampsia that I had the privilege of following for twelve years. She had eclampsia in her first pregnancy. Her blood pressure returned to normal very, very slowly; it took many weeks. She also had a moderate albuminuria for those many weeks. She finally returned to normal, remained so for nearly twelve years, that is, normal urinary findings. She became pregnant twelve years after the first pregnancy. She went through the second pregnancy apparently normal for seven months, then she had a beginning hypertension but no albumen until she had had the moderate hypertension for several weeks. Then all of a sudden, in the ninth month of pregnancy, she had a rapid rise of blood pressure which made it necessary to induce labor.

My guess in this case was that her kidneys were badly injured and there was enough normal kidney tissue left for apparently normal function. She was in good health, there was no abnormal urinary findings and even with the subsequently pregnancy the kidney was able to function normally until the burden began to be too heavy, then there was not enough tissue to carry on. This is only an assumption, but I think it indicates the prognosis.

I want to speak about the fallacy of average blood pres-

sure readings. A few years ago I made an analysis of the blood pressure readings of 526 cases and I came to the same conclusion that Dr. Schulze came to, namely, that there was a normal rise in blood pressure during pregnancy, that was by averaging my readings. It occurred to me that perhaps I had better analyze what occurred in the individual cases. So I took the average blood pressure readings of each case and I averaged them and I found that there was no rise of blood pressure during the normal pregnancy, although that had always been my impression and my figures seemed to prove it. Of course, I dealt with only 526 cases. That is not very many. There seemed not to be a rise in blood pressure, although I admit it is hard for me to get away from the impression that there is.

DR. F. L. ADAIR (closing): In answer to the questions regarding the fatal case, I would say that the patient was made worse with each succeeding pregnancy, and further injury was added to the lesion she had before. The cause of death in this case was the result of uremia which resulted from the arterio-sclerotic kidney.

Are convulsions peculiar to eclampsias? I don't think they are, but Dr. Hirschboeck has covered the differential diagnosis between uremia and eclampsia and I will not go further into that question. Of course, we have other findings than hypertension which establish a diagnosis of eclampsia. We occasionally run across an epileptic, and it is not unusual to have a case of hystero-epilepsy. I think we should usually be able to differentiate between uremia and eclampsia by the patient's urinary findings and blood chemistry, if you wish to go into it. I think a fairly good way to differentiate a uremic case from an eclamptic condition is one I think every one could apply. First, a careful history; second, physical examination for evidence of chronic renal disease; third, urinary examination—albumin with casts and cytologic elements in the nephritic, and little except albuminuria in eclampsias; fourth, the rapidly developing clinical course of eclampsia. These things should lead one to a correct diagnosis in most cases where more elaborate diagnostic measures are not available.

TOO MANY COUNTY SOCIETIES SLEEPING

Too many of our county societies are sleeping, arousing just enough at necessary intervals to keep their names on the books. The council is held responsible for them under the constitution and by-laws of the state association. It is hard to believe that the councils in some instances realize their responsibility. Perfunctory reports made at some annual meetings indicate that they do not. Councilors' reports made up from letters sent out the week before the annual meeting of the state association are not reports—they are evasions. Councilors are supposed to visit—actually visit—the societies in their respective districts at least once each year. How many do so? Councilors are supposed to "inquire into the condition of the profession," to "organize component societies where none exist," to be "peace makers and censors," to "improve the zeal" of county societies. These things cannot be done by writing a few letters ten days before the annual meeting and then turning in what

purports to be a report, which, formulated in that manner, nearly always makes it appear that everybody is happy and that medical organization is 100 per cent efficient, when, as a matter of fact, the formality of a funeral is about all that is necessary, in some instances, to carry out the very distinct indications as presented by the situation that really exists.

Within thirty days, the organization of five independent local medical societies has been reported in territory already occupied by county medical societies supposed to be alive and going. What's the matter? Why are the societies already in existence not meeting the needs of their members? Why do they find it necessary or desirable to go off and form new and independent societies? Those things are for the councilors in the respective districts to find out. And it is their duty to try to remedy any condition in the county societies concerned that is responsible for these undesirable situations.—*A. M. A. Bulletin*, Dec., 1923.

METASTASIS IN BREAST CANCER*

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The Duluth Clinic

Duluth

The object in bringing this subject before you today is to review with you several outstanding features that have been revealed by the study of some thirty-six cases of breast cancer that have been operated by us and in which the "follow up" has been completed.

The question of metastases in their relation to the prognosis, has been an interesting study.

The chief avenues of metastases in breast cancer are: (1) axillary glands; (2) to the clavicular chain of glands; (3) through the chest wall to the mediastinum; (4) to the peritoneal cavity; (5) local recurrences in the skin; (6) bony or skeletal metastasis.

The question must also be considered from the proper preoperative, operative and postoperative standpoints.

Axillary Involvement.—Our series show that 89 per cent had axillary involvement previous to operation. This percentage is about the same as that reported in other series of cases in the literature.

The presence of axillary involvement has not deterred us from advising operation, but especially indicates the desirability of preoperative roentgen therapy in this area. The operation has always included the removal of the glands and the gland bearing tissue about the vessels in the axilla.

Postoperatively 80 per cent of these cases have had intensive roentgen therapy, and in the cases operated 70 per cent have shown no evidence of recurrence of the axilla involvement. The other 30 per cent, however, did recur in the axilla. This very small number of recurrences in our opinion speaks very well for the effect of roentgen-ray therapy to the more superficial gland bearing areas.

Cases With Metastasis Into the Clavicular Group of Glands, Either Subclavicular or Supraclavicular.—This type has not been as numerous as the axillary type, primary metastases being noted in only 11 per cent of the cases. Recurrence in these cases has taken place in only 0.5 per cent.

It is our practice to first treat these cases with intensive roentgen-ray therapy before operation,

and then at the time of operation to remove all the glands and gland bearing areas up to and under the clavicle.

However, it does seem that the glands are better controlled by roentgen-ray therapy in the supraclavicular group than in the axillary group. This may be due to the fact that they are more superficial than the axillary group of glands.

Radium, in the treatment of this supraclavicular type of glands, has not been tried.

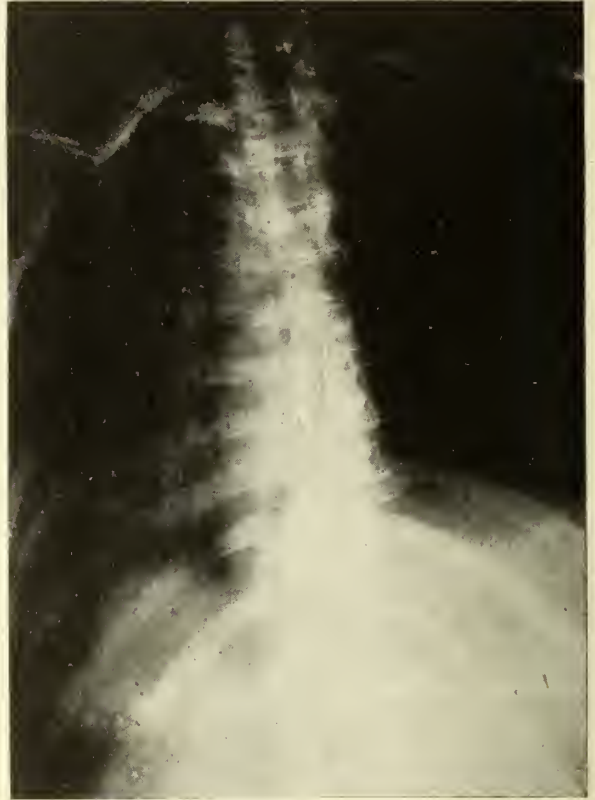


Fig. 1. Case 27120. Operated Oct. 22, 1921. July 18, 1922, shows Ca. Metastasis sixth dorsal vertebra.

Metastasis Through the Chest Wall to the Mediastinum.—Metastasis through the chest wall, to the mediastinum, in to the pleura, involving the lung, and extending to the opposite breast, has occurred in a number of cases. There were six cases that died from lung involvement. However, three of these cases died from a general carcinomatosis, and in these cases one must consider as to whether the metastasis was primarily through the chest wall or whether it was due to malignant emboli or metastasis from some other source. There have been no cases of malignant involvement of the pleura.

Metastasis to the opposite breast has occurred in

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0.8 per cent of the cases, the metastasis always occurring late.

One must also consider whether in these cases we have to deal with a new malignancy occurring in the opposite breast or to metastasis from the primary growth.

This type of metastasis also offers very satisfactory results with roentgen-ray therapy.

Recurrences to the Abdominal Cavity.—Recurrences to the abdominal cavity through the lymphatics has not been observed in our series, and a review of all the available literature reveals the fact that such avenues are possible, but it is more likely that liver metastasis is secondary to metastasis from bone or lung carcinoma.

Local Recurrences in the Skin Over the Amputated Area.—These have only occurred in 2.8 per cent of cases. This, we think, is a very good record, and believe it is due to three reasons: (1) Preoperative roentgen-ray therapy; (2) a wide dissection of the breast; (3) systematic postoperative roentgen-ray therapy.

Skeletal Metastasis.—Metastasis into the bone offers a very interesting study. Our series showed 0.25 per cent of those operated developed a bone metastasis.

Whether or not those cases had some metastasis before operation we do not know because this was

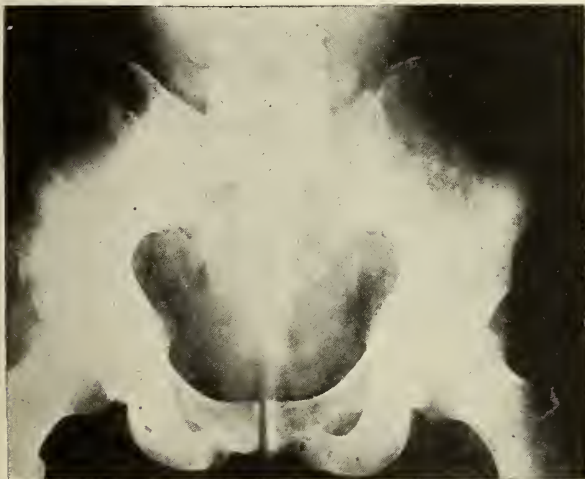


Fig. 2. Case 33611. Operated May 19, 1923. Picture Oct. 1, 1923, shows metastases left head of femur and beginning ilium.

not investigated before operation in any of the cases.

Metastasis occurs in the order of frequency in the head of the femur, the ilium, spine, sternum, ribs, skull and lower jaw.



Fig. 3. Case 26918. Operated Sept. 27, 1921. Picture Aug. 1, 1922, shows extensive metastasis of spine with marked deformity.

The elbow and the knee joint, and all of that part of the skeleton below the head of the femur, seem to escape metastasis.

Skeletal metastasis seems to become very well established before any symptoms arise, the only symptom being that of pain, which is very severe. The unfortunate point here is that although roentgen-ray therapy will to a certain extent relieve the pain, it seems to have, in our experience, no decided beneficial effect upon the process once it has become established.

The roentgen plates in these cases deserve very careful study, and are best compared with the normal in order to bring out the rarefaction of the bone.

Metastasis undoubtedly occurs by way of the lymph channels, although some authors suggest that it may come through the blood stream.

Kauffman, in his article on metastasis, finds that 52 per cent of those dead from carcinoma have skeletal metastasis.

It is my belief that this type of metastasis is more frequent than is generally supposed, and that

roentgen pictures of the head of the femur, the ilium and the spine should be taken in all cases of carcinoma of the breast before operation. It has been repeatedly demonstrated that local and glandular infection can be controlled and cured by the use of the roentgen ray. It has also been shown that once the metastasis reaches the bones the roentgen ray has practically no effect, except a palliative one.

It is universally agreed that the degree of malignancy in carcinoma is due to the type of cell found in the tumor. Tumor masses showing hyalinization and fibrosis generally speak for longevity, while those cells of a more embryonic type speak for a short life. The unknown quantity of the degree of resistance of the patient also must be taken into consideration. These facts have been very well shown by McCarty and Sistrunk in their very admirable work. It is generally recognized that the size of the tumor in the breast is of no particular prognostic value, but the involvement of palpable glands, with fixation, decreases the chances more than one-half for a favorable outcome.

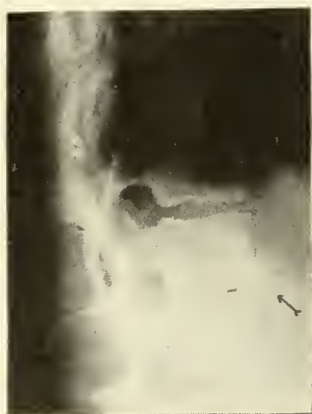


Fig. 4. Case 12660. Operated Sept. 1, 1922. Picture Apr. 10, 1923, shows beginning carcinomatous involvement vertebrae. Now has metastasis to ilium and femur.

It is also recognized that cancer, appearing after fifty years of age, is more favorable as to prognosis than that occurring before fifty, and that the younger the individual the more increased is the cell activity, and the more rapid the demise.

It is our opinion, gathered from these statistics, that it is much better to give the patient the benefit of the doubt and remove all fibromas, cystic mastitis and so-called "lumps" in the breast, this being a much safer procedure than to allow them to remain until such time as carcinoma develops

and metastasis has taken place, when the hopes of an ultimate recovery are certainly not good.

We believe, in view of the fact that skeletal metastasis is so common, and that when once found



Fig. 5. Case 29128. Operated Nov. 28, 1922. Picture Aug. 22, 1923, shows extensive metastasis ca. in femur.

the prognosis is hopeless, that it is better practice in all cases of breast carcinoma to take roentgen pictures of the ilium, head of the femur and the spine, so as to determine before operation whether there is any metastasis in these bones. If metastasis is found it would be very much better to refuse operation and attempt to treat with the roentgen ray, feeling sure that the ultimate outcome will be as favorable, and life will probably be increased by such a procedure.

We are also of the opinion that roentgen-ray therapy, from seven to ten days before operation, and then intensive system roentgen-ray therapy, giving about 130 per cent of the maximum skin dose over the local area, the glands, and also skeletal bones involved, is, in the line of our present knowledge, the best procedure we have for the treatment of carcinoma of the breast.

Lee reports that the length of life after recurrence was six and one-half months without irradiation, but after postoperative irradiation it jumped to two years and four months.

Radium has not been used because we believed that better penetration could be obtained with roentgen ray.

Conclusions.—1. Metastasis into the skin, axillary glands, supraclavicular region, and in the chest wall, is unfavorable, but the condition can be controlled or arrested by the intelligent use of roentgen-ray therapy.

2. Carcinoma of the opposite breast does not necessarily mean a metastatic involvement.

3. Metastasis into the skeletal structures, more particularly the ilium, the head of the femur and the spine, offers an exceedingly painful course and unfavorable prognosis. The pain, however, may be controlled to some extent by the roentgen ray.

4. We think it better practice to take roentgen ray pictures of the femur, the ilium, and the spine, before operative measures are instituted, and if rarefaction is found it would be much better to refuse operation in these cases.

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Fig. 6. Case 27120. Operated Sept. 22, 1921. Picture Dec. 18, 1922, shows metastasis ca. into ilium.

DISCUSSION

DR. W. E. SISTRUNK, Rochester: I was very much interested in listening to Dr. Coventry's paper, and I think he has brought out some very interesting and important facts. It has been customary with us for a good many years to take x-ray pictures of the lung and chest preliminary to operations for cancer of the breast, but up to the present time we have never made a routine habit of taking x-ray pictures of the bones. We have felt that the first symptoms of bone metastasis which would be recognized as being symptoms were symptoms of pain. It seemed as though

we very rarely were able to find involvement in bones without having some history of preliminary pain. In fact, I am able to recall one or two patients in whom we suspected possible bone metastasis, in whom the x-ray plates were

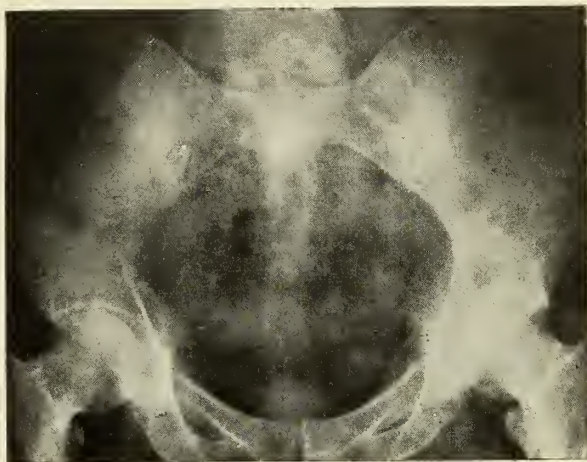


Fig. 7. Case 6046. Operated June 9, 1921. Picture Aug. 5, 1922, shows metastasis to ilium.

negative and who later continued to have symptoms and finally showed positive plates. But I think that the doctor's suggestion that the bones which seem most commonly involved be given roentgen-ray examinations—and especially in cases where glandular involvement is present—is certainly a very good one, and we all ought to bear it in mind.

I recently had an opportunity to review the histories of ninety-seven patients in whom we felt that we had fairly accurate data in regard to the points at which recurrences had occurred following radical operations of cancer of the breast. In this group a number died from general metastasis, but when we took them as a whole and studied them we found that in forty-seven per cent of the cases there were evidences of recurrence in the skin. Twenty-eight per cent of these had had glandular involvement at the time of the operation, and ten and a half per cent had had no glandular involvement at the time of the operation. Then we found another very interesting point and that was that in sixty and a half per cent of these people who came back with local recurrences we were able to demonstrate recurrences in other portions of the body at the same time.

I think that Dr. Coventry is correct in thinking that metastasis in cancer of the breast occurs very much more frequently in patients who have glandular involvement at the time of the operation. Now the time at which metastasis occurs in glands varies considerably, I think, in different patients. It is not a very uncommon thing to see a patient who has the type of carcinoma which probably has been present for several years or longer without any metastasis that we are able to locate. In these patients the growth is probably surrounded by a tremendous amount of fibroid tissue, and they are able to hold it in check. But in the ordinary patient at some time during the course of the disease metastasis will usually occur. It probably comes, I think, from the breaking down of the carcinoma

which allows a certain fluid to collect in the tumor which is picked up by the lymphatics. I imagine that all lymphatics which drain that region are likely to be affected at that time, and that that accounts for the frequent recurrences following operations for cancer of the breast. It is really appalling to see how advanced the majority of patients are in the disease when they consult you in regard to the trouble.

Recently in a study of two hundred and eighteen patients whom we were able to follow after operations for cancer of the breast, we found that the glands were involved in sixty and a half per cent of the people at the time of operation, and that in this group twenty of these people had ulcerated growths at the time of operation and sixteen had diffused growths which were scattered throughout the entire breast. Now the operations which we do give results which are almost entirely dependent upon the stage of the disease at which we operate. I think it is interesting to note the difference which comes following operative procedures in different stages of the disease. For instance, in going over this series which I have just mentioned, I ran across a small group of six patients who were operated upon for cancer of the breast in which a simple amputation was done. The condition was not recognized at the time of operation but later was found by the pathologist to be a definite cancer but an early type of cancer. But nothing further was ever done. We traced five of these six: Four were alive—66.66 per cent—for five to eight years after operation; one had died four years afterwards but we could not ascertain the cause of death; and another was traced for two years and then we lost track of her. But they were simple amputations and 66.66 per cent were alive with the possibility of another being alive.

Now when we studied the people who had been operated upon when the glands were not involved we found that in eighty-six patients, 64 per cent were alive from five to eight years after operation; but we know that in three of these who were alive recurrences had either been present or were present at the time. We took another group and considered people who had involvement of the glands. We found that of 132 people with involvement of the glands only 19 per cent were alive; and that with twenty people with ulcerated growths 85 per cent were dead in five years; and that with sixteen diffuse growths all were dead within five years.

So I think we ought to bear in mind the importance of operating on these cases early. It behooves us to try to educate the public to have all breast tumors examined early.

DR. C. A. DONALDSON, Minneapolis: It seems to me the important point in the doctor's paper is the question of radiating the bone for diagnosis prior to operation. I was surprised a short time ago, without the presence of pain, to find both femurs very seriously involved in breast carcinoma. There was no pain further than perhaps the first or second lumbar vertebra. This constitutes a very important preparation.

For a long time we have treated with the 125-kilovolt type of machine. We know now that it is impossible to penetrate with a cancer-killing dose more than about three

or four centimeters with such voltage. So if we are going to penetrate deeper we must use stronger apparatus.

On the question of operative work and the metastasis that occurs following it, there is a very interesting discussion by Handley in his second edition, comparing the work of Halstead and Cheyne. He describes Halstead's work as giving a wider dissection of the skin, and Cheyne's work as giving a wider dissection of the deep fascia; and he gives the results in their skin recurrences: Halstead getting sixteen per cent, I believe, and Cheyne six per cent skin recurrences. Doctor Coventry spoke of the wide dissection but he did not say whether it was of skin and fascia both or whether it was the dissection of fascia alone.

There are two important considerations that should modify our treatment a good deal. We do know that sufficient radiation kills cancer cells. The difficulty has been to get sufficient radiation to the widespread metastases, and more important is the fact that radiated tissue, when transplanted, does not grow. There is no use sending a neglected case to the roentgenologist when nothing can be done by the surgeon. We might as well recognize that fact. You can do something to modify the course of the disease, and you can give relief from pain; but you might as well send these folks home if they expect to be cured. Now I think those are the important factors.

DR. JAMES A. JOHNSON, Minneapolis: I am very pleased to have heard this splendid paper. Dr. Coventry has very carefully outlined the points of metastasis that occur in breast carcinoma.

There is one point of metastasis that I would like to emphasize and that is to the neck of the femur. Not infrequently a metastatic process in this location is overlooked. I can recall, while in one of the large Chicago Clinics, that I had on my service at one time three cases of pathologic fracture of the neck of the femur, unrecognized as such, due to metastasis from a breast carcinoma. One had been operated for carcinoma of the breast in the same hospital five years previous, with no local return and no evidence of foci in any other place. The other two were in younger individuals and had been treated for an ununited fracture for some time. The primary lesion in the breast had not been recognized—all three had received their fractures from a trivial injury which should have put the clinician on his guard at once.

I agree with Dr. Coventry that preliminary to operation it is essential to x-ray the lung and also the long bones, especially if there is any local bone pain or discomfort. This is especially important in advanced cases.

I also believe a preliminary x-ray treatment is of some value. I think, however, it is a mistake to carry it over a period of months when often much valuable time is lost. The operation should be undertaken shortly after the initial radiation. I believe post-operative radiation is of considerable value and should be continued for several months.

DR. W. A. COVENTRY, Duluth (closing): Only one word: The thing which stimulated me to this study was the fact that three of these cases developed bone metastasis within six months after they were operated. The patients were just getting on their feet and feeling quite happy, and all at once they were condemned to a slow death.

THE DIAGNOSIS OF ACUTE APPENDICITIS IN CHILDREN*

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My reason for bringing this subject before you today is twofold: first, because there are still too many unnecessary deaths among children with appendicitis, because of failure to make early diagnosis, and second, because it is a subject in which the general practitioner and surgeon are as much interested as the pediatrician.

In our series of fifteen cases under five, only four patients were brought to the surgeon inside of forty-eight hours after onset, and nine had generalized peritonitis (Table 1). It is agreed that if appendicitis can be diagnosed in the first twenty-four hours and the patient promptly operated on, the mortality is practically nil. Furthermore, in no condition is the cure so radical and complete as in cases of appendicitis after the removal of an infected appendix. It is evident, therefore, that all of our efforts should be directed toward early recognition of the condition, which may be accomplished quite successfully in the adult, as is seen by the mortality statistics of most hospitals. In infancy and childhood, the diagnosis is very much more difficult. The insidiousness of onset and the rapidity with which rupture of the appendix occurs make it difficult to get the patient to the surgeon before the infection has spread beyond the confines of the appendix. As Finney has emphasized, in the adult the tendency is to mistake other conditions for appendicitis, whereas in the child the tendency is to mistake appendicitis for some minor condition. Pneumonia is the one great exception to this rule, for not infrequently central pneumonia of the right lower lobe may give symptoms suggestive of appendicitis.

The younger the child, the more difficult the diagnosis of appendicitis, but fortunately also the less likely is the condition to be appendicitis. In a series of 16,571 cases of appendicitis collected by Kelly, only 2 per cent of the patients were under six years. Eight per cent were between six and ten years, and 16 per cent between ten and fifteen. Although the disease is very infrequent in the first

two years of life, the extreme mortality of 50 per cent in Abt's series of eighty cases makes an early recognition of the condition imperative. In most of his cases the diagnosis was not made until the inflammatory process had extended beyond the appendix, and in a number it was made only at necropsy. Our series of fifteen cases in patients under five years emphasizes the same points, the late diagnosis and early peritoneal involvement.

As brought out by these data, no greater responsibility presents itself to the physician than the decision in the case of an obscure abdominal condition. Although appendicitis is easy to diagnose early when it appears in its textbook form, in its atypical manifestation it is likely to tax to the utmost the diagnostic acumen of the physician.

TABLE 1
APPENDICITIS IN CHILDREN

Duration of illness before admission, hours	Fifteen cases, five years and under	Fifty-three cases between six and fourteen years
24	3	24
36	1	8
48	4	9
60	2	1
72+	5	6*
DEATHS		
Operative	3	3
Non-operative	4	
Appendiceal abscess	5	13
General peritonitis	9	10
Mortality, per cent	47	5.5

*Five interval operations.

HISTORY

The younger the child, the less probable, naturally, is the history of previous attacks. Churchman describes the case of an infant with an appendiceal abscess at twenty-seven months, who had had two definite previous attacks. The nature of the attacks is sometimes typical, sometimes, in retrospect only, suspicious of previous appendicitis.

In the group of fifty-three patients, seen during 1921 and 1922, in the Mayo Clinic, about 30 per cent had a history of previous attacks, and in the group of fifteen patients up to five years, only 6 per cent had such a history. In most instances it is a rather indefinite attack of abdominal pain associated with vomiting and slight indigestion. This rapidly passes off. As an exception to this rule, diarrhea of twelve hours' duration, without pain or vomiting and, so far as could be ascer-

*Read before the meeting of the Minnesota State Medical Association, St. Paul, October 10-12, 1923.

tained, no indiscretion in diet, was the only subjective evidence of two attacks. In the second attack local tenderness over McBurney's point directed attention to the real source of the trouble. At operation a long appendix, firmly adherent in its entire length to the posterior wall of the cecum, was found.

The history is further of importance in eliminating the abdominal prodromes of certain infectious diseases. The onset of measles, typhoid, or rheumatic fever may simulate appendicitis. Finney cites a case in which the day after the removal of a swollen, thickened appendix the child developed measles. In a second case, similar pain in the right iliac fossa cleared up when the measles broke out the following day, and in a third case, in which the patient was not operated on because the symptoms were indefinite and the brother had measles, operation was delayed until after the appendix had ruptured.

The increased frequency of appendicitis after gripe infections, and following an attack of typhoid, or ulceration of the bowel, makes these diseases of importance as possible etiologic factors.

In some cases there was a definite history of a previous appendiceal attack. This raises the question of whether one attack is sufficient indication for removal of the appendix in the interval.

SYMPTOMS AND SIGNS

The symptoms that are almost always present are vomiting and pain, but these symptoms are so frequently encountered in childhood at the onset of illnesses such as the acute exanthemas, respiratory infections, indiscretions in diet, and gastroenteritis, that we are prone to consider them lightly. If vomiting persists after the stomach has been emptied, and if pain continues also, it is of great significance. Pain at first is general, referred to the epigastrium, or around the umbilicus. Only later is it referred to the right lower quadrant. According to Bruening, the first pain is caused by excessive contraction in the appendix and cecum, and is referable to the ganglia. The local pain is due to irritation of the peritoneum. Not infrequently the attack may begin with sharp, acute pain in the right lower quadrant, colic-like in character and disappearing for a considerable interval, only to reappear with greater intensity.

In the fifty-three cases there were only two associated with diarrhea and retrocecal position of the appendix, in which the pain was entirely absent,

although there was tenderness on deep pressure. In seven of the fifty-three cases there was no vomiting, and in two others nausea, but no vomiting was noted. In only one case was there neither vomiting nor pain. The character of the pain varies tremendously, from a slight pain that permits a child to go about its play or walk to school, to an acute pain that doubles a boy up suddenly while he is working in the field. Constipation is usually not present, and diarrhea was present in five of my series of cases.

Pain on urination should always suggest the possibility of an irritation due to an inflamed appendix. It occurred in 8 per cent of Porter's cases. It appears too infrequently to be of any great help, and is of importance only in that pyelitis may cause a similar clinical picture, associated, however, with typical urinary findings.

Flexion of the right thigh, coming on acutely, or bending of the trunk toward the affected side is suggestive of appendicitis.

Respiratory symptoms, cough, expiratory grunt, and hyperpnea, are of value in suggesting a possible respiratory cause for pain localized over McBurney's point. The abdominal pain associated with infections of the throat may at times be suggestive of appendicitis.

Tenderness is perhaps the most important sign that can be elicited in the diagnosis of acute appendicitis. When found locally, it is of far greater significance than any other single factor in the diagnosis. It was present in all of the cases examined. It may be absent, however, particularly in young children, when the process has involved the peritoneum and an exudate fills the peritoneal cavity. It may be present for only a short time. One patient whose complete attack lasted only three hours, was seen by a surgeon after that interval, and he could find nothing. Another similar attack followed; with both there were fever, vomiting, pain, and a leukocytosis. An interval operation showed an appendix folded to a right angle and greatly thickened distal to the angle. Occasionally the tenderness may be on the left side, as in cases reported by Schellong and Porter, when the appendix extends into the left lower quadrant behind the bladder.

Rigidity of the muscles of the abdomen is usually found, but may be absent. The greatest difficulty in determination of both tenderness and rigidity is that the little patient, whether through fear,

crying, or bad temper, holds his abdominal muscles so rigid that palpation is useless. A few moments used in first winning the patient's confidence is frequently the basis of a successful examination. The confidence of the patient is particularly essential for a successful rectal examination. Rarely is it of use under four or five years of age as a means of determining tenderness, but it is helpful in determining infiltration or the presence of a mass. When children over five will co-operate, tenderness on the right side as compared with the left, is one of the most helpful signs in the diagnosis of appendicitis, particularly in the differential diagnosis from pneumonia.

If ether is used for the examination, the patient should be prepared so that he can be operated on immediately, if necessary.

clear cells is very suggestive of appendicitis, especially if the eosinophils are absent.

Local tenderness which later becomes general usually means perforation and generalized peritonitis. A mass in the right lower quadrant in an acute condition is usually an appendiceal abscess, although it may be merely the omentum folded around an inflamed appendix. A mesenteric cyst in the right lower quadrant may give symptoms and signs indistinguishable from those of appendicitis.

DIFFERENTIAL DIAGNOSIS

It is to be emphasized again that a differential diagnosis should be based on the history, the symptoms and signs, and a complete, careful examination of the entire patient. In this way only can we avoid operating for appendicitis on patients

TABLE 2
DIFFERENTIAL DIAGNOSIS

	Pneumonia	Appendicitis
History	Previous cold or cough Chest pain	Exceptionally, grippe Usually none
Abdominal pain	Severe, constant, general	Paroxysmal, less intense, local
Vomiting	14 per cent	70 per cent
Diarrhea	Common	Uncommon
Facies	Appearance of illness. Dilatation of alar nasi	Uncomplicated, not seen
Respiratory symptoms	Shallow abdominal breathing Expiratory grunt Slight dullness? Distant tubular breathing?	Shallow breathing Costal None
Abdominal tenderness	Superficial, severe Diffuse higher in abdomen No worse on deep pressure	Slight or severe More marked on deep pressure Local
Rectal examination	Negative	Tenderness on right side
Roentgen-ray examination of chest	Positive	Negative
Leukocytes	20,000 to 50,000 (uncomplicated)	10,000 to 20,000
Temperature	103° to 105°	99 to 102°

The child's temperature is usually higher than the adult's, ranging between 98.6° and 102°.

The leukocytes are usually definitely increased, the ordinary count ranging between 15,000 and 20,000. Occasionally counts between 20,000 and 30,000 are found, and exceptional counts as high as 40,000 have been noted, even with an acute unruptured appendix. The differential count, particularly a low count, is of the greatest importance. A low leukocyte count without a percentage increase in the polymorphonuclear cells usually excludes acute appendicitis. Eight thousand leukocytes with 85 to 90 per cent of polymorphonu-

who do not have it, and not overlook the condition in patients who need operation. In making a differential diagnosis we have to consider first those conditions outside of the abdominal cavity, namely, infections of the respiratory tract, prodromes of acute infectious diseases, measles, scarlet fever, typhoid fever with local pain and a polymorphonuclear leukocytosis, and osteomyelitis of the femur or ilium. In differentiating it from pneumonia, the following points, as emphasized by Adams and Berger, are to be considered (Table 2).

In the same way patients with pericarditis (Breneman) have been operated on for appendicitis,

due to referred pain, probably caused by irritation of the diaphragmatic pleura.

In the prodromal stage of acute infectious fevers and acute tonsillitis, the sudden onset, nausea, vomiting, abdominal pain, and local tenderness make a picture that is difficult to evaluate unless one has a careful history of exposure, and in the case of measles a leukocyte count and the probable presence of Koplik's spots at that stage. In one of three cases, all of which proved to be typhoid, because of local tenderness and polymorphonuclear leukocytosis the appendix was removed.

Osteomyelitis of the ilium may present symptoms that are differentiated from those of appendicitis with difficulty. I recently observed such a case, in which, however, the operation revealed that it was an appendiceal abscess and not a subperiosteal abscess as we had at first suspected. Finney cites a case in detail in which osteomyelitis of the upper femur simulated acute appendicitis, and was not rightly diagnosed until an abscess formed. An acute psoas abscess may give similar difficulty.

In cyclic vomiting the history of previous similar attacks, absence of local tenderness, and normal leukocyte count are usually distinctive. The danger in these cases is that the parents may mistake an acute appendicitis for merely another attack of cyclic vomiting, and call the physician only after the patient has grown progressively worse as a result of a ruptured appendix.

Conditions within the abdominal cavity that are likely to come into consideration are gastro-intestinal colic, mesenteric lymphadenitis (Brenneman), cysts of the mesentery, and intussusception of Meckel's diverticulum. Inflammation of Meckel's diverticulum may give a picture of appendicitis, but more frequently the case resembles intestinal obstruction due to volvulus.

Mesenteric lymphadenitis is described by Brenneman as giving a clinical picture identical with that of appendicitis. Lee reports two cases in which operation was performed, and enlarged glands found instead of the expected appendicitis. Cysts of the mesentery may cause acute attacks of pain localizing in the right lower quadrant with tenderness and a mass. In the case seen the pain was extremely severe, but usually lasted only a short time.

Attacks of colic are common in infants, particularly when too frequently fed. In older children there is usually some indiscretion in diet which ac-

counts for the pain. The attacks are paroxysmal and usually relieved by pressure. Between attacks of pain there is no local nor general tenderness, no fever, and if a leukocytosis is present, it is generally lymphatic in character.

Intussusception is commonest when appendicitis is rarest, that is, in the first two years of life. The sudden onset with periodic attacks of pain, absence of fever, constipation, bloody mucus from bowels, tumor, and no local tenderness make a characteristic picture, that is not likely to be confounded with appendicitis except late, when the invaginated bowel might suggest an appendiceal abscess.

CONCLUSIONS

1. Every acute abdominal condition in childhood should be considered appendicitis until it has been proved otherwise.

2. Acute appendicitis in infancy and childhood owes its peculiarity to the insidiousness of onset and its tendency to rapid perforation. Early diagnosis, therefore, is essential to a reduction of the mortality.

3. The dangers of appendicitis in children should be explained to parents, so as to make surgical aid available at a time when life can be saved.

4. The indiscriminate giving of cathartics to children with abdominal symptoms is an unwarranted and often dangerous procedure. Physicians should instruct parents as to this danger.

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DISCUSSION

DR. FREDERICK C. RODDA, Minneapolis: Our present conception of appendicitis is that it begins as an infection of the mucosa and probably in most cases is hematogenous in origin. Dr. Helmholtz has said it frequently follows infection that swings around to various parts of the body. However, I would call to your attention some work done by Rheindorf, during the last two years, in which he has found the ascaris in the appendix at the time of operation. He contends that the worm produces toxic substances which injure the mucosa, and is a determinative factor in the inflammation. Just how important this is, I do not know. We have given up the idea that worms cause any particular trouble,—we may have to revise our opinion.

In the differential diagnosis, Dr. Helmholtz did not stress pyelitis. I think an acute pyelonephritis, especially if it involves the right kidney, is liable to produce symptoms which simulate appendicitis. It is to be ruled out by urinalysis. The differential diagnosis of pneumonia and appendicitis is extremely difficult. If one suspects appendicitis, it is dangerous to delay for developments. The only sure means of differentiation is the fluoroscope or x-ray plate.

We have been impressed, in the last few years, with the frequency with which large mesenteric and retroperitoneal glands are found with an appendicitis. Dr. Helmholtz has mentioned this, and it has also been emphasized by Brennenman and Hudson. They are frequently found in groups, some of them as large as beans. We have obtained negative tuberculin reactions in these cases. They are evidently not tuberculous. Sections of some of these glands show a simple hyperplasia. Whether they are secondary to the appendicitis or arise from some independent source, we do not know. Brennenman, however, thinks at times they are the source of pain, and must be differentiated from acute appendicitis.

I should like to remark about the interpretation of the white blood count in cases of appendicitis. It is a fact that the white blood count in children is not as reliable as in the adult. At times the white blood count will be of very little help. I have in mind a little patient who had a white count of 10,000. The surgeon was inclined to think because of the low count that there was no pus present. At the time of the operation, however, a pocket of pus was found. He was then of the opinion that recovery was questionable because of the low count, and interpreting it as low resistance. However, the child made a speedy, uncomplicated recovery. I would feel that the history, physical findings and the exclusion of other conditions are the most valuable. I would put the white blood count at the bottom of the list of helpful findings in the diagnosis of appendicitis.

DR. E. S. JUDD, Rochester: Dr. Helmholtz asked me to discuss this paper for one or two reasons: he knows that I have had a good deal of difficulty in diagnosing appendicitis in children; possibly the other is that I have operated upon some of the cases that he has presented. I do not know of any problem that is more difficult than the diagnosis of acute appendicitis in children, at the first attack. There are so many other conditions that must be

considered. As I think over the cases I have seen, I recall pneumonia as a frequent complication, or a condition which must be ruled out if possible before a diagnosis is definitely made. We have had cases under observation for several hours endeavoring to make a differential diagnosis between an acute appendicitis and beginning pneumonia. I have afterward operated on these same cases. In some instances where we decided that the condition must be due to acute appendicitis, we found very little wrong with the appendix, but the child afterward developed a frank pneumonia. Undoubtedly they had a pneumonia from the start. On the other hand, a number of these children complaining similarly did have acute appendicitis but also developed pneumonia afterward. It seems to me that they must have had more or less of a general infection, appendicitis, and the chest condition at the same time. Then again, I have operated on a few expecting to find appendicitis (though I was not sure whether the condition was pneumonia or acute appendicitis), and found that these children had acute appendicitis, but this group never developed any chest symptoms or any evidence of pneumonia afterward.

I do not know whether there is any way of making an absolute differentiation between an acute appendicitis in a child in its first attack and the beginning of pneumonia. I think most of them must have an abdominal infection and a lung infection at the same time. Of course, we do not like to operate on a child with pneumonia, but the risk of permitting the condition to develop into suppurative appendicitis and peritonitis, we all know, and Dr. Helmholtz' figures show the danger of that.

A point regarding the surgical aspect of this condition. It seems to me that the infections in children are more virulent than in adults. Ordinarily, we feel that it is safe to wait forty-eight hours in adult cases and at operation still expect to find the trouble confined to the appendix, but I have seen a great many children where the appendix has ruptured in twenty-four hours. With adults, we have adopted to a large extent the treatment suggested by Ochsner, thus assisting the patient to wall off the infection with the idea of later establishing drainage, and making an appendectomy. I believe that we should operate on cases of acute appendicitis in children at the end of the second day, even if we feel that the appendix has ruptured. The peritonitis may not be diffuse. I feel sure that our results would justify this procedure.

Another question that Dr. Helmholtz brought up in his paper, interested me: should the child be operated on after having had only one attack? I think we should operate, if the diagnosis can be made. I also wanted to emphasize the point that he made in saying that the most important single factor in the diagnosis of acute appendicitis in children is local tenderness. It requires some little time to get the confidence of the child before one can get anything as to the difference in resistance in the abdominal muscles. I have been very much interested in watching the pediatricians in just this particular in their contact with children and realize that after gaining confidence this sign becomes most valuable.

DR. ROY ANDREWS, Mankato Clinic, Mankato, Minn.: We know that pyelitis in younger children is generally without any definite symptoms but pyelitis in older chil-

dren may have definite manifestations. I recall two cases we had of children over six years of age that were brought in with a diagnosis of appendicitis made by the parents themselves. They had severe pains in the right side, intermittent in character but with an absence of local tenderness which we would expect in a child of that age. The urine of these children was loaded with pus and some blood. We must remember that pyelitis is not so easy to diagnose, that is, the first specimen of urine does not always tell us the story. Many times it will take three or four specimens of urine before one finds pus.

Another condition that has puzzled me and will continue to puzzle me is retrocecal appendicitis in children. Usually they are difficult to diagnose because the tenderness and spasticity come on rather late. I think it is very difficult to make an early diagnosis of retrocecal appendicitis.

DR. T. L. BIRNBERG, St. Paul: It has given me great pleasure to be here today and hear this paper. The subject of appendicitis in children has been a thing that has puzzled me a great deal. You always hear the surgeons talking about operations for appendicitis but I must confess in our work we have had very few appendices. I often wonder if we have had them and were not able to diagnose them. The differential diagnosis is one of extreme importance, and as Doctor Judd said we must gain the confidence of the patient and slowly make our diagnosis. I get considerable benefit by asking the child to himself show me where his pain is. After he shows with the palm of his hand, as he always will, I ask him: "Please, with your one finger show me the place that it hurts." Now: "Which place does it hurt the worst?" Meanwhile talk with him about school, the school teacher, and things of that nature and get his mind on different things. Gradually his fear will relax and you get what you are after.

There are two things in differential diagnosis of great importance, pyelitis and pneumonia. Those must be ruled out in every case before operation. I make it a rule that no patient should be operated for appendicitis before a urinary examination is made and an x-ray of the chest. Surgeons are very prone, when they examine a patient and find pain in the side and temperature, to say: "We will take out the appendix right away." These findings are very good and very accurate in adults but in children they are misleading and we are not willing to take the risk in doubtful cases. It is better to be safe and operate an hour or two later than to operate on a pneumonia case. We have seen a good many other pneumonias after appendices through mistaken diagnosis.

The question of diarrhea. In adults constipation is the rule in appendicitis cases but it is not unusual in children to have loose bowels and very small, frequent stools. Small, frequent stools are a little unusual in infants in appendicitis. The high temperature often worries a surgeon, he will be afraid of 103 and 104 Fahrenheit. I must confess that whenever a high temperature is presented I think first of pyelitis or pneumonia and appendicitis last. Do not pay too much attention to high temperature in children, because it might be run in an effort of thermotaxis. The temperature will suddenly go high without great cause, as well as the leukocyte count. The leukocyte count in children may go up very high without being of much consequence.

THE CHAIRMAN (Dr. H. Z. Giffin, Rochester): Anything that will assist in the diagnosis of appendicitis in these very young children it seems to me is most important. I am afraid that the rectal examination is apt to be neglected in young children. In appendicitis a sensitiveness in the right lower quadrant by rectal bimanual examination can almost always be elicited; moreover, a pelvic abscess is not infrequently detected by this method when abdominal symptoms are confusing.

DR. R. C. LOGEFEIL, Minneapolis: I am reminded of a case in which I was called in consultation, a short time ago. It was a child about ten years of age who had been running a temperature of about 103 in the evening for the past three or four days. At times the child complained of some pain in the abdomen but there was no nausea or vomiting. When the surgeon had seen the case the temperature was normal and the leukocyte count somewhere between 15,000 and 20,000. On account of absence of tenderness and rigidity in lower right abdomen, he made a temporary diagnosis of a central pneumonia and advised an x-ray. I was called in to see the child the next morning and found that the x-ray was negative as well as the urine examination, the latter ruling out a possible acute pyelitis.

On examination I found the child complained mostly of pain in the lower part of the right chest especially when taking a deep breath. I followed Dr. Birnberg's hint, which I learned when I was under him at the City and County Hospital, by asking the child to show me the exact point of tenderness with one finger. She could not do this as it seemed to hurt over the entire lower chest and upper abdomen on the right side. I am frank to say I did not have the nerve to make an exact diagnosis of anything but I believed on account of the definite rigidity and slight tenderness in the upper right quadrant, that there must be an acute abdominal condition present, and advised operation.

Another surgeon was called in consultation after I saw the case and he, for no reason that I could see, unless he had more nerve, diagnosed an acute pus gall-bladder and the case was operated half an hour later. I had the opportunity of witnessing the operation and saw the surgeon reveal a long retrocecal gangrenous appendix which extended upwards toward the liver with a ruptured tip and an abscess just below the gall-bladder. There was a localized peritonitis with a hepatitis and I assume an inflammation of the peritoneal surface of the diaphragm which accounted for the pain on breathing. I certainly can agree with those who have spoken before me, namely, that the diagnosis of acute appendicitis in children is often very difficult.

DR. H. T. HELMHOLZ, Rochester (closing): I want to emphasize again what Dr. Judd has said about the difficulties of the differential diagnosis of pneumonia and appendicitis and to say that I think it is better to operate on an occasional pneumonia, thought to be appendicitis, than to let an acute appendicitis go to generalized peritonitis.

With regard to pyelitis, I must confess that I have never encountered this difficulty; I suppose because of my interest in pyelitis that is always the first thing I think of. The only case in that connection that we did have difficulty with

was an acute hydronephrosis, in differentiating it from an acute appendiceal abscess.

Another thing that I would like to emphasize in connection with the differential diagnosis of pyelitis and appendicitis is the value of a catheterized specimen and the presence of bacteria at a time when pyuria is not present. I think particularly in these early cases one might find a urine swarming with bacteria when there is no pus and it be of great help in the diagnosis.

In conclusion I want to thank those who have discussed this paper in bringing out in detail some of the points I could only lightly touch on.

But it is a secondary matter, after all, whether a school is under State or University control, whether the endowments are great or small, the equipments palatial or humble; the fate of an institution rests not on these; the inherent, vital element, which transcends all material interests, which may give to a school glory and renown in their absence, and lacking which, all the "pride, pomp, and circumstance" are vain—this vitalizing element, I say, lies in the men who work in its halls, and in the ideals which they cherish and teach. There is a passage in one of John Henry Newman's Historical Sketches which expresses this feeling in terse and beautiful language: "I say then that the personal influence of the teacher is able in some sort to dispense with an academical system, but that system cannot in any way dispense with personal influence. With influence there is life, without it there is none; if influence is deprived of its due position, it will not by those means be got rid of, it will only break out irregularly, dangerously. An academical system without the personal influence of teachers upon pupils, is an Arctic winter; it will create an ice-bound, petrified, cast-iron University, and nothing else."

Naturally from this standpoint the selection of teachers is the function of highest importance in the Regents of a University. Owing to local conditions, the choice of men for certain of the chairs is restricted to residents in the University town, as the salaries in most schools of this country have to be supplemented by outside work. But in all departments this principle should be acknowledged and acted upon by trustees and faculties, and supported by public opinion—that the very best men available should receive appointments. It is gratifying to note the broad liberality displayed by American colleges in welcoming from all parts teachers who may have shown any special fitness, emulating in this respect the liberality of the Athenians, in whose porticoes and lecture halls the stranger was greeted as a citizen and judged by his mental gifts alone. Not the least by any means of the object lessons taught by a great University is that literature and science know no country, and, as has been well said, acknowledge "no sovereignty but that of the mind, and no nobility but that of genius." But it is difficult in this matter to guide public opinion, and the Regents have often to combat a provincialism which is as fatal to the highest development of a University as is the shibboleth of a sectarian institution.—From *Teacher and Student*, William Osler.

THE MORE COMMON NEUROLOGIC DISORDERS ASSOCIATED WITH PAIN, AND ENCOUNTERED IN GENERAL DIAGNOSIS*

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Section on Neurology

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Although the medical profession, in general, casts an indifferent or a scornful eye on the pagan subject of neurology, the fact remains that no less than 10 per cent of patients examined present some neurologic symptoms or aspects that enter into the general diagnosis. This is particularly true of nervous disorders associated with pain. The spread of an impulse to every part of the neuron provides many pitfalls in diagnosis, and disappointment for the surgeon who finds that the disease refuses to respond to the rites employed to banish it.

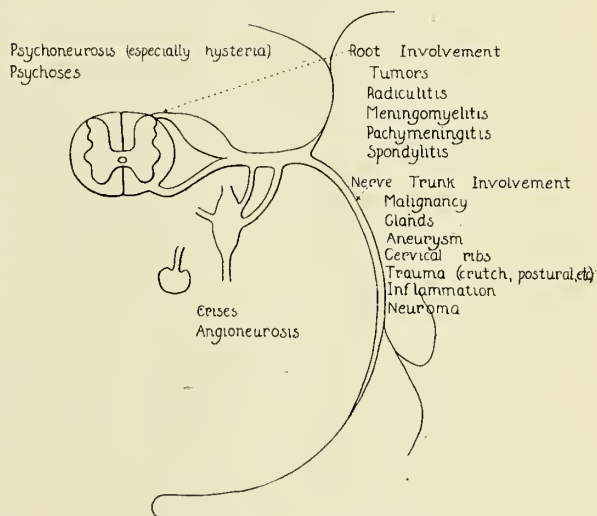


Fig. 1. Diagrammatic survey of nervous disorders that often enter into differential diagnosis.

In the process of diagnosis it is customary to visualize such structures as the liver and the stomach, but the nervous system is habitually disregarded, a practice which sooner or later leads to difficulties that might have been obviated had some such simple diagram, as is represented in Figure 1, been kept in mind.

Lesions within the substance of the brain or spinal cord, while at times associated with pain, do not lead to diagnostic difficulties sufficiently often

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to warrant extensive discussion.¹ An exception must be made with regard to tumors of the brain, extracranial neoplasms, such as nasopharyngeal malignancy, and various neuralgic and painful disorders around the head for which optometric, nasal, and dental manipulations are often instituted. However, attention is here directed more particularly to root pains, and to abdominal crises, the origin of which is probably in the vegetative nervous system.

ROOT PAINS

Root pains are often erroneously interpreted as intercostal neuralgia, pleurisy, pericarditis, appendicitis, cholecystitis and kindred abdominal conditions, lumbago, and sciatica. They usually present characteristic features, most typically seen in pressure from spinal cord tumors, that should lead us to suspect the possible nature of the lesion, al-

though the ultimate proof may be very difficult. Table 1 illustrates the salient features of root pains and the points of contrast and similarity as applied to sciatic neuritis, with which it is often confused.

ILLUSTRATIVE CASES

Case 1 (A438405). *Spinal cord tumor with pain leading to multiple operations.* Mrs. C. S., aged twenty years, complained chiefly of pain in the right lumbar and abdominal areas. One and one-half years before, a dull ache appeared to the right of the second lumbar spine, radiating laterally to the lower costal margin. The pain was more constant at night and caused the patient to sleep in a chair. Fourteen months before, the appendix and part of the right ovary had been removed without relief; eight months before, the pain radiated to the right knee, and a cast was applied to the leg for several weeks. Four months before, the remaining portion of the right ovary was excised without benefit.

The patellar and tendo achillis reflexes were slightly

TABLE 1.

THE MORE CHARACTERISTIC FEATURES OF ROOT PAINS AS COMPARED WITH THOSE OF SCIATICA

	ROOT PAIN	COMMON TO BOTH	SCIATICA
Location:	Anywhere. Referred to peripheral distribution of neurone. At first unilateral, later bilateral (girdle) and symmetrical.	May be same.	Buttock, posterior aspect of thigh, calf. Rarely bilateral.
Character:		Usually dull ache.	
Onset:	Gradual.		Often acute, especially after strain, exposure or "cold."
Course:	Continuous or recurrent. Spreading to contiguous territory, especially to opposite side; growing in intensity.	Reappearing at intervals. Worse on coughing, sneezing, straining.	First attack often the worst. Field of activity unchanged.
Tenderness:	None.		Present at nodal points.
Flexion of head:	Aggravates pain.		No change.
Kernig and Lasègue:		Present, especially if tumor is low.	
Spine:	Often fixed.	Listing common.	
Temperamental idiosyncrasies:	Without pain on retiring; awakened at 3:00 a. m. by pain, relieved by kneeling or exercise. Returns to bed toward morning. Often prefers to sleep sitting in chair.		Often kept awake by pain on retiring. Pain wears off gradually, allowing patient to sleep. Worse on exercise. Worse on sitting in chair.
Weather and temperature influence:	None.		Often striking. Pain worse on cold, relieved by heat.
Neurologic findings:	Sensory, motor, reflex, and spinal fluid.		Tendo Achillis reflex often absent in severe cases. Nodal tenderness. Positive Lasègue.

more active than normal; positive Babinski reflex was present on the right, a doubtful one was noted on the left. Vibration and joint sensibility were slightly impaired over the right lower extremity. There was slight urinary urgency. The spinal fluid was straw colored, the Nonne reaction was positive, there was one lymphocyte, zone I colloidal benzoïn reaction, and no fluctuation on jugular pressure. An extramedullary cord tumor was removed from the anterior aspect of the seventh thoracic segment.

The appearance of this patient did not indicate any abnormality of the nervous system. She walked without difficulty, was aware of no disturbance of sensation, and suffered no impairment of sphincter control. The story of characteristic root pain, however, at once suggested the possibility of a spinal cord tumor. (Fig. 2.)

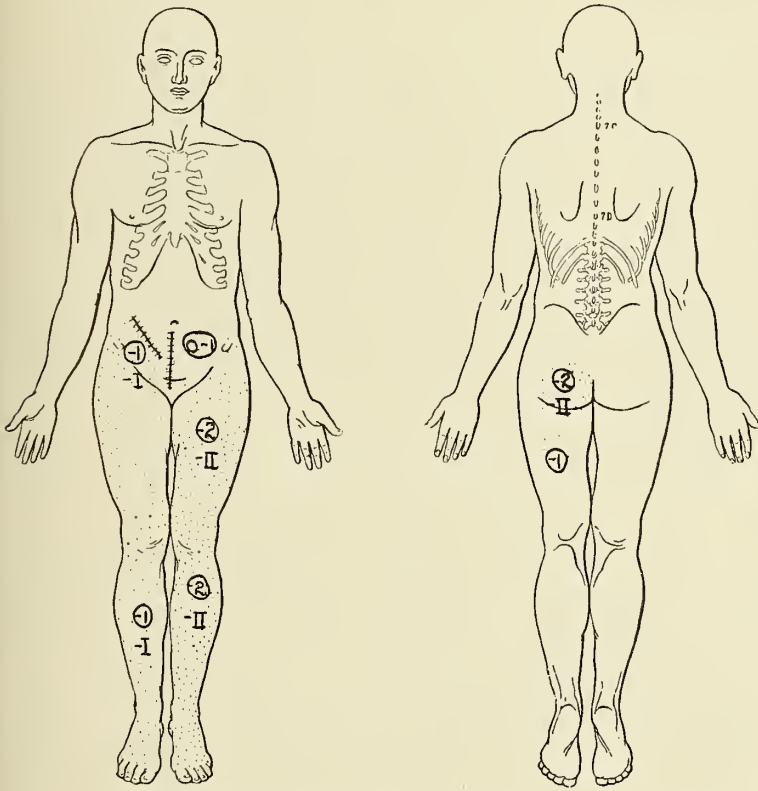


Fig. 2. Case 1 (A438405). Spinal cord tumor with pain leading to multiple operations. The general appearance of this patient did not indicate any abnormality of the nervous system. (The Arabic numerals refer to tactile sensibility, the encircled Arabic numerals to pain sensibility, and the Roman numerals to temperature sensibility. 0 signifies normal, and -4 complete loss, intermediate figures representing intermediate degrees. The plus sign represents increase, +4 being the maximum.)

Case 2 (A386055). *Caudal tumor masquerading as sciatica for ten years. Hypertrophic arthritis.* Mr. J. C. McL., aged fifty-two years, had developed a dull pain in the left sacro-iliac region, thigh, knee, and calf, ten years before examination at the Clinic. The pain was worse at night and was relieved by exercise, so that the patient often worked at night. There was no relation to changes

in the weather. Five years before, his teeth had been extracted and tonsillectomy performed without relief. Three years before, the pain extended to the right side of the back and down the right leg, so that he was unable to lace his shoes. The pain disappeared for two years following the administration of laudanum and salicylates by rectum, and changing the style of shoes. For the last thirteen months the pain had been worse and the patient used morphin daily. He never missed his work.

The Lasègue sign and Nonne test were positive. Hypertrophic arthritis of the lower dorsal spine was diagnosed roentgenologically. A neurofibroma was removed from the level of the second lumbar vertebra.

The objective neurologic findings included only the positive Lasègue and the positive Nonne tests. It was largely on the basis of the history that this patient was explored for a caudal neoplasm. The

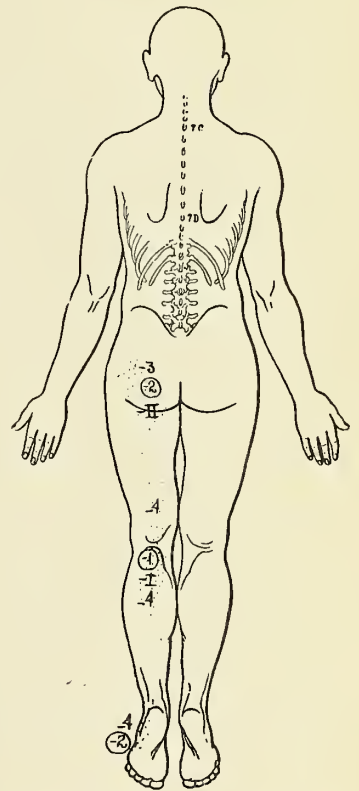


Fig. 3. Case 3 (A380470). Caudal tumor simulating sciatica.

hypertrophic arthritis, which was observed in this case, is commonly associated with cord tumors, and often confuses the diagnosis.

Case 3 (A380470). *Caudal tumor simulating sciatica.* Mr. W. S., aged thirty-five years, complained of sciatica. Three and one-fourth years before, he had contracted flu,

and during the attack remained in a shack without food for one and one-half days, the temperature being 36° below zero. Following this, severe pain appeared in the lumbar spine, left hip and thigh. The pain occurred more often at night, when the patient slept in a chair, or obtained relief by walking. He could "tell when the sun set and when it rose" by the intensity of the pain. There was no relation to the changes in the weather. For two months he had had a constant tingling sensation along the outer surface of the left thigh.

The patient listed to the right. Flexing the head caused an increase of the pain in the left leg. The Lasègue sign was positive. The left tendo achillis reflex was absent. There was marked impairment of tactile sensibility and slight impairment of pain and temperature sensibility over the posterior aspect of the left leg and the lateral aspect of the foot (Fig. 3). The first, second and third lumbar spines were tender. The Nonne test was positive, and there were seven lymphocytes. Chondrofibroma arising from the third sacral intervertebral disc was found at operation.

Root and nerve trunk pains are often one of the earliest indications of a malignant process. In the search for a possible primary focus, a rectal examination, the elimination of the possibility of a primary carcinoma of the lung, and inspection of the nasopharynx should never be neglected. Involvement of the posterior root ganglia is well exemplified in herpes, which may be followed by a post-herpetic neuralgia. Doubtless a ganglionitis is not always evidenced by vesicle formation, and presumably a typical herpetic neuralgia may develop without the preliminary appearance of vesicles.

GASTRIC AND ABDOMINAL CRISES OF NEUROSYPHILIS

Gastric and abdominal crises are almost always an expression of parenchymatous syphilis of the central nervous system, but may be associated with migraine, angioneurotic edema, and unknown causes in apparently healthy persons. Crises are usually typical and present certain characteristics. The onset is sudden, with pain or vomiting, usually both, but either may occur singly, or there may only be flatulence, extreme nausea and sialorrhea. The pain is usually near the middle-line, and symmetrical; it may be dull, sharp, aching, cramping, squeezing, gripping, burning, or numb in character. The intensity may be mild or grewsome, and the duration from a few hours to several days. The pain is rarely continuous, and ceases suddenly. There is no interval abdominal complaint, unless the condition is complicated as by ulcer. The crises are recurrent, and the intervals vary widely. There is no tenderness to deep pressure, but there may be

marked hypersensitivity to light touch, and objective evidence of syphilis is usual.

Of 120 patients with syphilitic gastric crises, thirty-one (25.8 per cent) were operated on. (Table 2.)

TABLE 2

OPERATIONS IN 120 CASES OF SYPHILITIC GASTRIC CRISES	
Appendectomies	20
Operations on gallbladder.....	14
Operations on stomach.....	12
Operations on pelvis (ovaries removed in five cases, tubes in one, suspension in one).....	8
Operations on kidneys (Dietl's crisis one).....	3
Adhesions	3
Exploration	2
Reduction of colon.....	1
Total	63

ILLUSTRATIVE CASES

Case 4 (A334732). *Gastric crises of tabes: multiple operations.* Mr. G. D., aged thirty-six years, had had specific urethritis, and possibly syphilis, at the age of twenty years. At the age of twenty-nine he experienced his first gastric crisis, which awakened him at 2:00 a. m.; appendectomy was performed at 5:00 a. m. At the age of thirty-one an operation was performed for adhesions, and one year later a gastro-enterostomy; four years later 15 cm. of "kinked ileum" was resected, with return of another crisis before the patient left the hospital. The attacks were grewsome in their intensity, and reduced the patient to a groaning, quivering heap.

Examinations were negative except for positive Wassermann and Nonne reactions, and 18 lymphocytes to a cubic millimeter of spinal fluid.

Case 5 (A374807). *Gastric crises of tabes: multiple operations.* Mrs. C. H., aged thirty-seven years, had had typical gastric crises five years before. At the same time the right eye deviated outward with subsequent diplopia. Four years before, the appendix had been removed without relief; the gallbladder was then drained with similar result, and subsequent gastropexy proved unavailing.

Right ptosis, complete bilateral external rectus paralysis, irregular and Argyll Robertson pupils, absent patellar and tendo achillis reflexes, very active abdominal reflexes, and reduced muscle tenderness were noted. The serologic examination was negative.

The abdominal scars testify to the splendid resilience of this tabetic patient. The complete right sided ptosis, the bilateral external rectus palsy, the irregular, Argyll Robertson pupils, the absent patellar and tendo achillis reflexes had no restraining influence on the persistent endeavors of surgical research to disclose some point of visceral strategy from which these symptoms seemed to emanate. (Fig. 4.)

Case 6 (A273093). *Gastric crises of tabes: multiple operations.* Mrs. W. J. S., aged fifty years, had contracted syphilis thirty years before. For the last four years she

had suffered greatly from "rheumatic" lightning pains and attacks of abdominal pain associated with vomiting. Two years before she was temporarily blind in both eyes. Eleven months before, an operation had been performed on the gallbladder, and two weeks later a nephropexy was performed, both without relief.

Unequal and Argyll Robertson pupils, left optic atrophy, absence of right patellar reflex, diminished left tendo achillis reflex, absence of muscle tenderness, marked delay in pain sensibility, positive Wassermann reaction on the spinal fluid, and 36 lymphocytes to the cubic millimeter were noted. (Fig. 5.)

Characteristic objective findings of parenchymatous neurosyphilis. Case 6 was introduced in order

Typically they are sharp in character; short in duration, as though the patient had been shot through the leg or touched with a lighted cigarette; spot-like more often than lightning-like, so that the painful spot might be covered easily by a silver dollar; severe or mild in intensity; they appear in showers, are present usually in the lower extremities, are not limited to the regions of joints, and may leave the skin hypersensitive to light touch, but not to heavy pressure.

Fixed pupils or even Argyll Robertson pupils, which react to accommodation, but do not react to

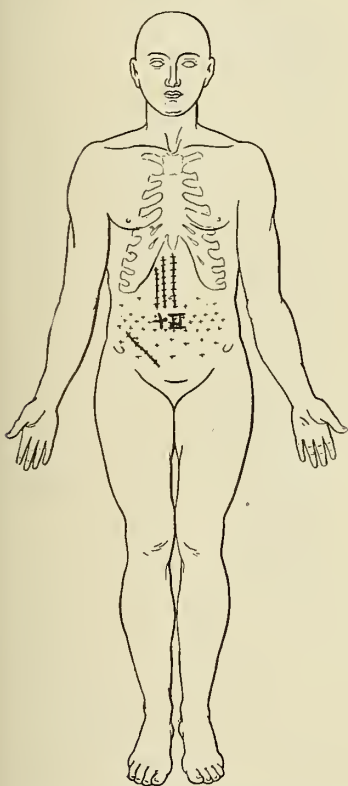


Fig. 4. Case 5 (A374807). Gastric crises of tabes. Multiple operations. The abdominal scars testify to the splendid resilience of this tabetic patient.

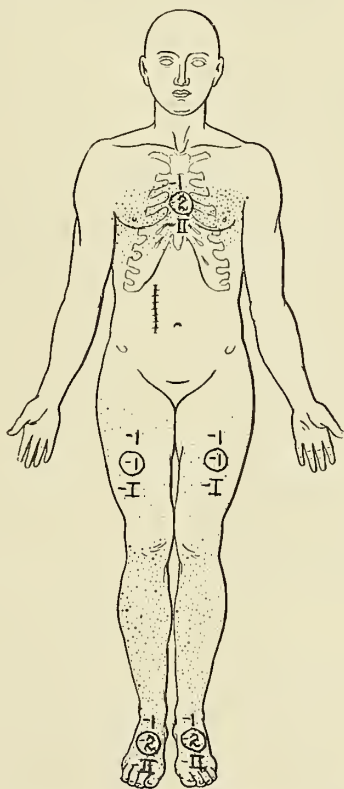
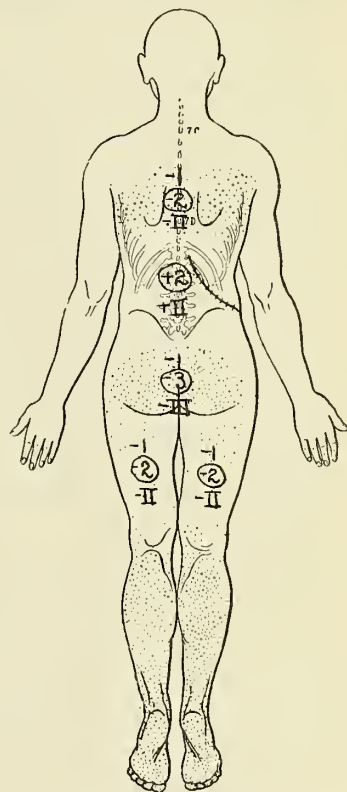


Fig. 5. Case 6 (A273093). Gastric crises of tabes. Multiple operations showing characteristic objective findings of parenchymatous neurosyphilis.



to show some of the very characteristic objective findings of neurosyphilis. A closer analysis of the "rheumatism" revealed typical lightning pains. Formerly as many as seventy-five kinds of pain were differentiated. Today very few are considered characteristic of an illness. Lightning pains are almost pathognomonic of parenchymatous syphilis of the central nervous system; they rarely occur in cases of diabetic multiple neuritis, syringomyelia, or in healthy persons, without demonstrable cause.

light, are no longer considered pathognomonic of syphilis. They may be present with epidemic encephalitis, and may be familial, although rarely. If they are unequal and irregular as well as Argyll Robertson, they usually indicate syphilis. A diagnosis of neurosyphilis, however, should never be made on one sign alone.

The patient in Case 6 also had a chest zone of diminished sensibility, which may involve any quality of superficial sensation. Oppenheim re-

lates the case of a woman who in the course of a banquet pinned a flower to her waist, passing the pin through the underlying breast. She was unaware of this until she discovered the fact on undressing that night. While a chest zone may occasionally be noted in other nervous diseases, such as in syringomyelia, it is ordinarily strong evidence of syphilis. In this case, furthermore, pain sensibility was delayed longer than touch sensibility in the feet; when the feet were pricked with a pin, the patient perceived the touch of the point before she felt the pain. This delay is seldom noted in any disease other than parenchymatous neurosyphilis.

Finally, there was an absence of normal muscle tenderness. When one of the bellies of the gastrocnemius muscle is pinched firmly, the patient normally gives lively evidence of pain. When this tenderness is absent in the presence of voluntary movement or fairly intact cutaneous sensibility, the possibility of syphilis should suggest itself at once. In multiple neuritis the tendon reflexes are often absent as they sometimes are in tabes, but in the former, muscle tenderness is exquisite, while in tabes it is often greatly impaired or absent.

ABDOMINAL CRISES OF NON-SYPHILITIC ORIGIN

Abdominal crises are not alone seen in cases of parenchymatous syphilis. The patient in Case 7 obviously had syphilis, but the appearance of the crisis evidently antedated the syphilitic infection.

ILLUSTRATIVE CASES

Case 7 (A328858.) *Abdominal crises (migraine? syphilis?)*; *multiple operations*. Mrs. J. H., aged forty-six years, had had periodic headaches since the age of twelve years; at the age of twenty-three, abdominal pains were associated with the headaches. The pain was most severe in the right upper quadrant, was continuous, sharp and cutting, and associated with vomiting; it lasted about six weeks. The patient had lost 75 pounds in weight. Morphine was required for relief. She was married at the age of twenty-eight. Eight years before examination, she had developed unsteadiness in walking, girdle pain, hyperesthesia of the abdomen to cold and heat, lightning pains, incontinence and impaired vision. Five years before, the gallbladder was explored and found to be negative. The patient's mother had had migraine headaches with vomiting; one brother had had abdominal crises of pain without vomiting or headache ever since he was eighteen; another brother had had intense abdominal crises of pain and vomiting with headaches since the age of eighteen; and one son had abdominal crises of pain, with or without vomiting, but always with headache.

Nystagmus to the right, unequal, irregular, Argyll Rob-

ertson pupils, absence of the right patellar reflex, slight ataxia, slight impairment of joint sensibility in the toes, absence of vibratory sensibility over and below the pelvis, impaired tactile sensation with localized hyperhidrosis over the fourth dorsal segment on the right, marked impairment of pain sensibility, and slight urinary incontinence were noted. The serologic examination was negative. (Fig. 6.)

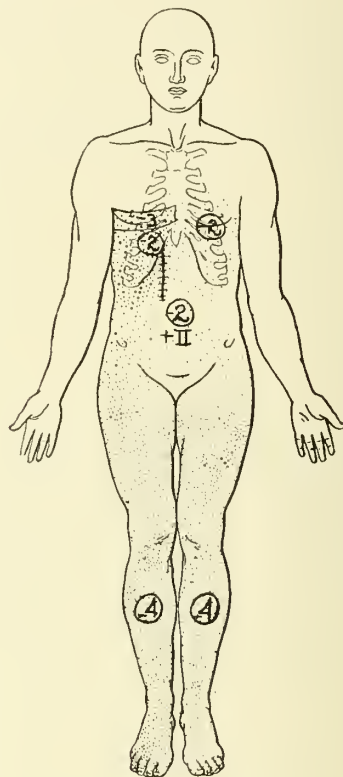


Fig. 6. Case 7 (A328858). Abdominal crises of migraine (?) in a patient having tabes.

Abdominal migraine. Buchanan has discussed the abdominal manifestations of migraine, and Moersch has emphasized the protean expressions of this disorder. The existence of abdominal migraine is not only questioned, but openly ridiculed in certain quarters. This attitude calls to mind the story of Francisco Sizzi, a Florentine astronomer, who argued against Galileo's discovery of a new planet in the following manner: "There are seven windows in the head, two eyes, two ears, two nostrils, and a mouth" (which we may paraphrase by saying, the appendix, the stomach, the gallbladder, and so forth). "From which, and many similar phenomena in nature, such as the seven metals, the seven days of the week, and so forth, which it were too tedious to enumerate, we gather that the number of planets is necessarily seven." The abdominal crises of migraine are particularly interesting,

since the diagnosis depends entirely on the history of the case.

Case 8 (A278573). *Appendectomy and abdominal exploration without relief.* Miss E. H., aged twenty-eight years, had begun at the age of twelve years to have attacks of black spots before the eyes for five minutes, blindness for three-quarters of an hour, aphasia three and three-quarters hours, intense headache for from two to four hours, followed by abdominal pain of four to five hours' duration (at times so intense as to require morphin for relief), and continuous vomiting, without pain, for from three to four days. At the completion of the attack, a watery evacuation of the bowels occurred. The headache stopped at the age of seventeen, but the abdominal attacks continued. At the age of twenty-four appendectomy was performed, and four years later a negative abdominal exploration, without relief. The family history was negative.

Detailed examination, including full investigation for syphilis, was negative.

Case 9 (A245593). *Asthma; angioneurotic edema; local syncope, and duodenal ulcer.* Mr. H. C. S., aged fifty years, had had attacks of abdominal pain since the age of sixteen, coming on about four times a year, and of three or four hours' duration. The pain was intense, epigastric, accompanied by nausea and vomiting, and relieved somewhat by pressure. Attacks were always introduced by brilliant, scintillating scotomas followed by blindness. There was no headache. The patient also distinguished other types of pain, evidently related to duodenal ulcer. His mother had had attacks of "terrific abdominal pains" associated with blindness and vomiting of from three to four hours' duration, coming on about twice a year for ten years. A brother had similar attacks. One sister and one brother suffered from severe attacks of migraine headaches. For the last seven years the patient has had attacks of asthma, and for the last year angioneurotic edema, the swelling persisting for three days at a time. There were also local syncopal attacks involving the fingers. The asthma, edema, and blanching were not familial.

All skin tests were negative. There was fluctuating eosinophilia from 15 to 55 per cent, with 16,000 leukocytes. The diastolic blood pressure was 92, the systolic 60. Roentgen-ray examination revealed a duodenal ulcer. Pleurisy, adhesive pericarditis, slight fatty changes in the liver, thickened walls of the gallbladder, one healed gastric ulcer, and one active duodenal ulcer were found at necropsy.

Most patients with abdominal crises of the migraineous type have had at least one abdominal operation with negative results.

Abdominal disturbances associated with brain tumors. In some instances the vomiting and abdominal discomfort associated with brain tumors have led to operation on the abdomen. This is particularly true of fourth ventricle tumors.⁵ The abdominal distress complained of by these patients is possibly vagal in origin.

Vascular disturbances of the peripheral vessels may be associated with intense pain and anesthesia. This is particularly true of thrombosis or embolism of the vessels producing ischemia or infarction neuritis. Palpation of the vessels helps to establish the diagnosis.

Pain in cases of amputation-neuroma is many times central in origin and cannot be relieved by incision of the neuroma, injection of the plexus, or section of the posterior roots. Needless to say, in these cases of psychalgia, peripheral operations only aggravate the pain.

Pains of hysterical origin. We often fail to acquaint ourselves with the endeavors of mental analysis and mental hygiene. Our mental and emotional operations have no limitations. Like the philosopher's description of the universe, they are like a huge sphere whose center is everywhere and whose surface is nowhere. That we must be on the alert constantly is illustrated by the case of a woman who came to a physician complaining of pain in her side, for which her appendix was removed. Pain in both hands and in both feet, which she insisted on talking about, was disregarded. She later confided, with ecstasy, that she was Christ crucified. The diagnosis of hysterical conditions is, however, seldom so transparent, and we all contribute amply to the monumental blunders committed in this field.

Case 10 (A402420). *Hysterical pain and paralysis of foot, of six months' duration, treated as a tuberculous ankle.* Miss A. A., aged seventeen years, had tripped on the school stairs and sprained her right ankle six months before coming to the Clinic. The doctor who was called shook the foot roughly and told her to use it. Following this, the foot became extremely painful, and she could not move it. Another physician applied a cast for three weeks, with no improvement. The condition was diagnosed tuberculosis of the ankle and an operation discussed.

There was loss of voluntary movement of the right leg and foot, "exquisite tenderness," and emotional lability. The patient's father had died recently, leaving a large family without resources. Her mother was a "crêpe hanger." The patient was much hurt by the lack of sympathy on the part of the first physician, greatly impressed by the extreme solicitude of the second, by the cast, and by the prospect of operation. She recovered under treatment by suggestion and faradism.

Case 11 (A432880). *Hysterical dyspraxia and pain.* Mrs. F. M., aged thirty-four years, complained chiefly of pain and disuse of the right arm and fingers, pain in the right abdomen, hip, knee, and spine. The "whole right side was bad." Five years before, much to her distaste, but compelled by circumstances, she had taken a stenog-

rapher's course. While doing this, a dull pain appeared in the right hand which drew away from its task involuntarily on every effort to use it; she felt as though the fingers were torn out at the roots. The patient became nervous, had spells of crying, shaking, universal numbness and rigidity with loss of speech and movement, but retention of hearing. She was given hypodermic injections of morphin almost daily because of abdominal pain, for a period of two years. She was told that the right ovary was diseased. Three and one-half years before coming to the Clinic, tonsillectomy had been performed, and three years before, appendectomy, without relief.

The objective examination was negative, except for obviously hysterical dyspraxia in the use of the right hand, shifting areas of tenderness, and excessive emotional lability. The patient had married first at the age of sixteen; she gave birth to a daughter at the age of eighteen. The husband was drowned when the patient was twenty years of age. She was married a second time to a young man whom she loved, but whom she left because he did not support her. (This marriage was kept secret until discovered through a dream the patient related.) The stenographic course was taken at the age of twenty-nine. She could not earn her living and failed at five positions. She married a wealthy bachelor, aged fifty-six years, for whom she did not care. This man was extremely jealous, and encouraged the patient's undisciplined daughter, aged sixteen years, to marry a shiftless wretch many years her senior. The patient had often dreamed that she saw a recent picture of herself, which stands framed on her husband's dresser, replaced by one taken before her third marriage, when she was a beautiful young woman. A very common dream is that the patient is walking along the street when she is accosted by a very handsome young man (her second husband) who asks for her telephone number. At this moment a horrible old man, all covered with long black hair, jerks her away and threatens to arrest her for talking to a stranger. (The striking thing about her present husband is his "beautiful long black hair.") She declares her innocence. In a recent dream, the patient, with the assistance of a young doctor, is shaking a bowl of urine on which is floating a greasy substance.

Popular misconceptions, and sometimes even physicians, are responsible for the development in patients of an anxiety neurosis, from which they suffer more intensely than from the disease. Such anxiety is often aroused inadvertently by the physician's silence, or by implication of a diagnosis not yet justified or possible. Much harm and seldom good may be done by adding the element of fear. One patient, having long since recovered from his physical illness, felt that he must continue being ill and unable to work because he had been told that he would be so for about four years. A bugaboo too often attaches to the following diagnoses, leading to unnecessary invalidism: pre-incipient tuberculosis (compare the good morale, lack of fear, and co-operation of patients who know

they have the disease, in sanitariums); high blood pressure, will be dead in a year; heart disease; cancer, which they have not; Bright's disease; masturbation (when the Sunday school teacher, reformer, and quack too often advise gratuitously; unfortunately the doctor is seldom consulted). There are more suicides on bright sunny days than on cloudy days, and there are almost no suicides during catastrophes. Our patients' fears, self indulgences, and complexes should be discovered, removed, and replaced by common sense and a robust philosophy.

The neurologic conditions most often missed in diagnosis, and which consequently lead to abdominal operations are: gastric and abdominal crises, usually syphilitic; root pains, usually in cases of cord tumor; vomiting due to cerebral lesions, especially tumors of the fourth ventricle, when associated with abdominal distress; hysteria or family traditions, such as "Brown's stomach"; and constitutional somatic deficiency, and biologic inferiority.

Neurologic diagnoses too frequently made are neuritis (for root pain, referred pain, myositis, bursitis, vascular disturbances, especially thrombosis and embolism); neuralgia, especially the rare condition of intercostal neuralgia; functional disorders, for example, telegrapher's cramp, to explain pain; and syphilis of the nervous system. These errors are seldom due to inadequate knowledge in a special field, but usually find their source in faulty histories, and in the attempt to treat the patient's body to the neglect of his mind. As Seneca said centuries ago, "The two blessings of life are a sound body and a quiet mind."

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DISCUSSION

DR. ARTHUR S. HAMILTON, Minneapolis: Doctor Woltmann has just given us a very well prepared and carefully considered paper, as he always does. I am glad that he particularly emphasized the question of root pains. I think

root pains are not well enough understood, not enough attention is ordinarily paid to them. I suppose that pain is the most common complaint with a patient; certainly it is in neurologic lesions. The patient comes complaining of some kind of pain or distress from which he or she wishes relief. In a general way there are two classes of pain, perhaps not very clearly divided in fact, much less in our minds, but in a general way we think of pain as due to an organic situation and pains of functional origin. Under functional we may include cases where the patient complains, such as malingerers who pretend they suffer pain although they do not.

There is something more or less characteristic in the way people present their complaint of pain. A man who has a pain of organic origin will locate it always in the same spot. He has no particular difficulty in telling you where it is and he outlines it clearly. If he has any occasion to speak of it or to return to it under different points of his examination he gets it about the same; whereas it is really very striking how functional pain is always complained of at some one point in the examination as very severe, and yet you come around some time later in the examination to the same part and the same part of the story and somehow the pain seems to have been moved.

A man who has an organic pain can usually outline it clearly; if you ask him where the pain is he can outline it clearly with his finger; but the man who has a functional pain is very much more likely to pass his hand loosely over some part of the body and say: "It is about here." I was reading an article the other day by Dr. Spellman and Dr. Fraser of Detroit, on a series of cord tumors, and I noticed a striking thing. They took a considerable series of cord tumors such as came back over quite a period of time, and the average time from the onset of the first symptoms that were more or less suggestive of what the trouble might be until a diagnosis was actually reached was 2.5 years, which seems a rather long time, I think a longer time than is necessary.

I remember one of those cases particularly; Doctor Woltmann knows the case because he deserted me later on and went to him. A man had had an operation for gallstones. As far as I could find out there was a pretty vague statement of what was found at the operation. He had a definite pain in the region of his gallbladder, to be sure. Just exactly why the pain should have gone away after the operation I don't know, but he said it did. By and by it came again and he went to another surgeon. He was operated upon for gallstones and this time it is clear that no gallstones were found. He was better for a while. Then he went to a third surgeon and he had a terrific pain in the gallbladder but, strange to say, he had this pain on the left side. I saw him and diagnosed it very quickly. Not only had he had the pain, the root agitation, but the thing had gone on so far that he had developed a definite numbness on the right side. Afterwards Doctor Woltmann informed me that they found a spinal tumor on this side and the man was relieved.

Root pains that occur in such cases as tumors of the cord are pretty suggestive from the beginning. I do not mean one can make a diagnosis of spinal tumor on the

basis of root pains appearing, but if the root pain appears in a definite region or is continuous, it may vary somewhat in degree but it is sometimes continuous and always in the same region it is at least a suggestive symptom. Then if there comes a pain on the opposite side of the body at the same level, it becomes a very suggestive thing, and here one should make a diagnosis as one sees the product so very clearly of a transverse myelitis of the cord substance due to some infection. When a man has a perfectly clear picture of a root pain on one side and a subsequent root pain on the other side, and after having such a situation lasting several months until the man becomes paralyzed, that syndrome does not suggest a myelitis at all, it suggests a pressure lesion on the cord.

There are other methods by which one may diagnose absolutely the actual organic pain from those of functional origin. As to malingering pain, if you do anything in the course of your examination which is supposed to bring on the pain severely and you have been observing the patient's pulse and you find there is no rise of the pulse at the time when you were supposed to be hurting him pretty severely, it is pretty positive evidence that the pain is not a pain of organic origin. That is the case particularly in the back, where so many patients complain of pain, and there is no contraction of the muscles. They remain relaxed throughout the examination and you have grave reason to doubt whether the thing is of organic origin. As I said before, it is rather striking how people will complain bitterly of a painful place of some sort in connection with their illness at one stage of the examination and you go on with the examination and come back to the same pain and the patient has apparently forgotten about the matter or if he has not wholly forgotten it he describes it in a different way and locates it in a different position.

Of course, it is well known that some people bear pain very much better than others. Some people complain a great deal of a small matter while others complain but little in a very serious matter. The question of numbness—I don't know as we can speak of this as a pain but it belongs in the field of sensation. It is widely known that patients who mangle in respect to total loss of sensibility almost always fail to make their loss of sensation in any way comply with the known sensation of the part, and he cannot even keep the limits of his loss of sensibility at the same point. The man is unable to outline things as they were before when you come back to your question. In situations of that kind we find a certain sense derived from experience that leads us to believe that the man is not dealing honestly with you in these cases of malingering.

I think there is another way in which you can distinguish real from simulated pain. If it is real pain and you touch anywhere near the affected part you get practically an instant response, but in the other case, as you recur to the area from time to time, you will find that it takes an effort of the memory of the person to evince pain and there is an appreciable interval of time before he registers pain.

DR. L. A. NIPPERT, Minneapolis: Before considering pain as a manifestation of a neurological disorder and re-

ferring our patient to the neurologist for treatment we should remember that its origin may be distant from the subjective location as the following cases which came to my mind as I listened to Dr. Woltmann's interesting and exhaustive paper will show:

CASE 1: A woman previously healthy taken with severe griping pain in the pit of the stomach with nausea and vomiting. Examination of abdomen was negative. On the following day she herself drew my attention to a swelling in Scarpa's triangle which had not been exposed during the previous examinations. The diagnosis of strangulated femoral hernia was apparent.

CASE 2: Sciatica for which a patient had been treated for weeks was caused by a small spindle-cell sarcoma press-

ing on the nerve. It caused his death four years later by metastases in the brain.

CASE 3: Lumbago after having been treated by a number of physicians was found, after several negative x-ray investigations, to be due to an invasion of the vertebra by carcinoma, the primary focus of which was the prostate.

CASE 4: A young physician just recovering from a long exhausting attack of inflammatory rheumatism, pericarditis and endocarditis complained of pain in the right groin; after a few days caries of a lumbar vertebra was found to be the cause of his pain.

Therefore search carefully for a focus of pathology before assuming that the pain is a functional disturbance.

In the first place, in the physician or surgeon no quality takes rank with imperturbability, and I propose for a few minutes to direct your attention to this essential bodily virtue. Perhaps I may be able to give those of you, in whom it has not developed during the critical scenes of the past month, a hint or two of its importance, possibly a suggestion for its attainment. Imperturbability means coolness and presence of mind under all circumstances, calmness amid storm, clearness of judgment in movements of grave peril, immobility, impassiveness, or, to use an old and expressive word, *phlegm*. It is the quality which is most appreciated by the laity, though often misunderstood by them; and the physician who has the misfortune to be without it, who betrays indecision and worry, and who shows that he is flustered and flurried in ordinary emergencies, loses rapidly the confidence of his patients.

In full development, as we see it in some of our older colleagues, it has the nature of a divine gift, a blessing to the possessor, a comfort to all who come in contact with him. You should know it well, for there have been before you for years several striking illustrations, whose example has, I trust, made a deep impression. As imperturbability is largely a bodily endowment, I regret to say that there are those amongst you, who, owing to congenital defects, may never be able to acquire it. Education, however, will do much; and with practice and experience the majority of you may expect to attain to a fair measure. The first essential is to have your nerves well in hand. Even under the most serious circumstances, the physician or surgeon who allows "his outward action to demonstrate the native act and figure of his heart in complement extern," who shows in his face the slightest alteration, expressive of anxiety or fear, has not his medullary centers under the highest control, and is liable to disaster at any moment. I have spoken of this to you on many occasions, and have urged you to educate your nerve centers so that not the slightest dilator or contractor influence shall pass to the vessels of your face under any professional trial. Far be

it from me to urge you, ere Time has carved with his hours those fair brows, to quench on all occasions the blushes of ingenuous shame, but in dealing with your patients emergencies demanding these should certainly not arise, and at other times an inscrutable face may prove a fortune. In a true and perfect form, imperturbability is indissolubly associated with wide experience and an intimate knowledge of the varied aspects of disease. With such advantages he is so equipped that no eventuality can disturb the mental equilibrium of the physician; the possibilities are always manifest, and the course of action clear. From its very nature this precious quality is liable to be misinterpreted, and the general accusation of hardness, so often brought against the profession, has here its foundation. Now a certain measure of insensibility is not only an advantage, but a positive necessity in the exercise of a calm judgment, and in carrying out delicate operations. Keen sensibility is doubtless a virtue of high order, when it does not interfere with steadiness of hand or coolness of nerve; but for the practitioner in his working-day world, a callousness which thinks only of the good to be effected, and goes ahead regardless of smaller considerations, is the preferable quality.—From *Aequanimitas*, William Osler.

It has been said that in prosperity our equanimity is chiefly exercised in enabling us to bear with composure the misfortunes of our neighbors. Now, while nothing disturbs our mental placidity more sadly than straightened means, and the lack of those things after which the Gentiles seek, I would warn you against the trials of the day soon to come to some of you—the day of large and successful practice. Engrossed late and soon in professional cares, getting and spending, you may so lay waste your powers that you may find, too late, with hearts given away, that there is no place in your habit-stricken souls for those gentler influences which make life worth living.—From *Aequanimitas*, William Osler.

MINNESOTA MEDICINE

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EDITORIAL

The Mellon Tax Plan

The paramount issue before Congress and the American people today is the so-called Mellon plan of tax reduction. The need for increased taxation to meet the various governmental activities incident to the World War necessitated special tax measures. Authorities differ as to the advisability of the particular methods adopted. It has become more and more apparent that the distinction made between taxable and tax-exempt securities has greatly curtailed business enterprise and has affected business activities in general. The medical profession has been affected for the greater part indirectly by the situation.

In an article which appeared in the A. M. A. Journal for January 26, 1924, entitled "Why the medical profession should be relieved from present tax burdens," a concise statement appeared of the

arguments why certain changes in federal tax laws should be made.

Under the Harrison Narcotic Act, as amended by the Revenue Act of 1918, the narcotic license fee for physicians was increased from one to three dollars. Inasmuch as the income from this act from all sources largely exceeded the cost of the enforcement of the act, the increased fee is essentially a special tax discriminating against the profession. While the sum is rather insignificant to the individual physician, the total sum in Minnesota alone amounts to several thousands of dollars.

According to the present income tax laws, the physician may charge to professional expense certain items incurred in the pursuit of his profession. This includes membership in medical societies and traveling expenses in consultation work. The Commissioner of Internal Revenue has ruled, however, that expenses incident to medical society meetings or post-graduate study are not deductible from the gross income of the physician as not being strictly necessary professional expense. Such a ruling tends to restrict the attendance on medical meetings, discourages self-improvement in the physician and works to the detriment of the public at large.

The new federal tax law contemplates placing a lower tax rate upon earned incomes as distinguished from income from investments. The idea is a new one, but one which seems reasonable and one which would work to the benefit of the profession.

The poll of the nation at present being conducted by the Literary Digest is of interest and shows a predominance of opinion in favor of the Mellon plan. It would seem that those in opposition to the plan must be influenced by a narrow conception of the purpose of any tax. Any tax which discourages the branching out of business or professional activities is pernicious.

Money Matters

The physician has been proverbially a poor financier. The present day physician is much more business-like in the management of his financial affairs than formerly, but there is room for improvement.

The practice of medicine is a profession and the evaluation of medical services in money is often a most difficult matter. In each locality, however,

fees for professional services are pretty well standardized while each physician is forced to modify his charges according to the patient's ability to pay. This does not mean that a physician should charge what the traffic will bear.

Efforts have been made by county societies from time to time to draw up fee schedules for the particular locality concerned. As a rule such schedules have been intended for the general practitioner and have affected only a small percentage of the membership. Fee schedules for surgical procedures are difficult to determine for one reason, because preoperative and postoperative care are such variable factors. Any schedule must of necessity allow considerable leeway in either direction, for each physician must use his discretion in charging his patients more or less than the scheduled fee according to the financial status of the patient. A schedule of fees would be of distinct value in workmen's compensation and insurance work as thus the fee rate would be established by the profession and not by insurance companies or the lower courts. After all is said and done, the fee schedule has not proved practical.

The distinction between free and pay patients should be more clearly drawn. Most physicians give a certain amount of their time and are glad to do so in connection with free hospital or clinic activities. The experience obtained in such work is generally considered ample compensation. This is fortunate, for the profession gets little credit from anyone for such service rendered. On the other hand, the profession has the right to demand that patients able to pay medical fees be not treated at free clinics, whether supported by state, county, city, or private society. Just because a clinic or hospital is supported by taxes is no reason why every one is entitled to free medical attention. If it is argued that every taxpayer is entitled to free care at a city hospital, for instance, the argument is equally sound that the medical staff is entitled to pay for services rendered. The medical profession donates its services to municipal and certain state hospitals and clinics, but the class of patients treated by such institutions should and can be controlled by the local medical society. The importance of competent social service work in connection with free clinics is apparent.

The conscientious physician is only too ready to offer a patient in financial straits the privilege of going to a free institution. Thus the free institu-

tion performs a service to patient and physician alike.

In recent years the state has undertaken the treatment of tuberculous and venereal disease, with the idea that the treatment of these transmissible diseases needs state assistance in order to prevent infection. The time element in the treatment of tuberculosis makes the financial drain on the afflicted individual particularly burdensome, and practically the profession has not suffered from the assumption by the state of the treatment of these individuals. The insistence on the treatment of venereal patients necessitates in a few instances the treatment of individuals well able to treat with private physicians. The dissemination of knowledge incident to state activities along these lines, as a matter of fact, has increased private examinations.

In certain localities the physicians have joined the local commercial credit bureaus and are thus in a position to know the deadbeats in a community. The physicians in the larger cities are at a distinct disadvantage in this respect. Business men in any community recognize the value and importance of credit bureaus and listings. It is high time that each county society established such a bureau. On the other hand, we are not in favor of medical societies acting as collection agencies.

The time has long since gone by when the physician sent out his statements every six months or kept no books at all. Statements should be sent out promptly on the first of each month. Business methods in the practice of medicine are no reflection on the profession and uniformity in such matters would do much to correct the impression generally prevalent that doctors' bills may be left to the last.

MISCELLANEOUS

ELECTRIC LIGHT AND POWER BONDS—A GOOD EXAMPLE OF THE THINGS THAT MAKE AN INVESTMENT WORTH BUYING

By SAMUEL O. RICE
Educational Director,

Investment Bankers Association of America

This article comes right down to specific classes of bonds and endeavors to convey essentials in what investments to buy and why to buy them. Electric light and power bonds of sound, well-managed companies are among the safest and most desirable investments. The reason they are so

is because the demand for electricity is greater than the electrical industry can supply, although electrical companies are annually putting more than a billion dollars a year into extensions and improvements of their plants and transmission lines.

The foregoing is only one of many sound reasons why the electrical field is so desirable for investors. There are many others. But don't understand me to say that all electric light and power bonds are good buys. That is not true of any class of investments, commodities or property. The investor should have dependable information that the bonds he buys are those of sound, well-managed companies. He should know that the general field or class he contemplates investing in is sound. Electricity can sell more of its product that it can produce and the demand is constantly increasing. There is no substitute for electricity. But all electrical companies are not well-managed or conditions in some locality may make it difficult for a company to succeed although it be engaged in one of the most prosperous lines of business in the world.

Sales of electricity by central stations in the United States will run close to \$1,300,000,000 this year. The very reliable *Electrical World* makes that estimate. The total sales of electricity for the first six months this year were \$649,300,000, which was 19.5 per cent more than the \$542,000,000 received in the first six months of 1922. In the first six months this year electrical companies issued in excess of \$600,000,000 in stock, bonds and notes to obtain capital for extensions and betterments of generating plants and transmission lines. As I said, electrical companies are putting more than a billion dollars a year into extensions and improvements in an effort to keep up with the demand for more and more electricity.

Where is all this demand for electricity coming from? Is it sound? Will it last? Those are pertinent questions. Let us consider the three great markets that buy electricity. These three are electric lighting, electric railways, and electricity for power uses in industry, in mills and factories. The greatest demand for electricity is from the industries, although many persons erroneously believe that the greatest market for electricity is for lighting homes and streets.

There were 24,351,676 homes in the United States when the 1920 census was taken. Of these only about 8¼ million homes are lighted by electricity. That leaves a great number of homes yet to be lighted by electricity. Of these, a large number are included in about 7 million farm homes, but quite a few millions of homes without electricity are city and town homes and daily many of them are becoming electricity users. Homes having electric lights generally have greatly increased their consumption of electricity by more artistic and better lighting. Bridge lamps and several colorful table lamps are common in almost every living room and parlor where a few years ago one single electric globe sufficed. The number of electric lights has been increased in every room in every modern home, be it bungalow or mansion. Added to this increase in illumination is the use of electricity for cooking, for operating washing machines and other home appliances and for ironing.

Electricity was first most largely used for lighting. Then electric railways developed and became the greater market for current. Today, however, factories and mills that use current for power are the greatest market for electricity. It is a tremendous new development that the public knows little of. I know one industrial plant whose electricity bill runs close to \$35,000 a month.

But there is still another development in the electrical industry that every investor and prospective investor should appreciate. It is "super-power," the interconnection of different electricity companies so that the greatest economy and efficiency in producing and distributing current can be brought about. A few years ago this interconnection was impracticable because the industry did not know how to handle high voltages economically. Current is most cheaply transported on high voltage lines. Improvements, largely in insulation, have made it practicable to transport high voltages economically considerably more than a hundred miles and thus greatly increase the efficiency of generating plants. A few years ago, no matter how much current it could produce, a plant was limited in its "output" because it could not transport electricity a long distance. Now all that has been worked out and interconnection between plants hooks up many states.

It is impossible to portray in this short space all the great picture of "super-power" and interconnection. One little advantage of this development will indicate its great importance and usefulness. Water power electric plants usually have two extremes in production of current. Low water and flood may both cut down the current producing by the hydro-electric plant. In such a situation a hydro-electric plant might not be able to serve all its customers. In many cases interconnection solves that difficulty. The current simply is drawn from some steam power electric plant perhaps a hundred or more miles away. Likewise, when the water-power plant is operating at full capacity the distant steam plants can cut down on the use of coal by drawing current through their interconnection with the water-power plant.

I mention only a few salient points to indicate the sound field of the electrical industry. Any business that has as large a usefulness and demand cannot but be fundamentally sound. Would I advise physicians to buy electric light and power bonds? I wouldn't advise anybody to buy anything. Every man's investment requirements are different from those of every other man or woman. A person's income, obligations, dependents and many other conditions should be carefully considered and his investments be made to fit that situation. I write this only to suggest that anyone with something to invest consider the electrical industry. There are other utility bonds and industrial bonds just as safe and desirable as the best electric light and power bonds. All should be considered and the investor should keep their characteristics in mind so that he may diversify his investments, not put them all in one enterprise. My suggestion is not to buy electrical industry bonds, or any bonds or stocks without first consulting an honest, established dealer in securities. It is the greatest essential in making sound investments.

OBITUARY

DR. LUTHER EMMETT HOLT

Dr. L. Emmett Holt, who died in Peking, China, on January 14, 1924, will perhaps be longest remembered as the author of a book, "The Care and Feeding of Children," which, through twelve editions, has been for twenty-five years an authority in the homes, not only of the United States, but of South America and Europe, and in China and Japan, where it has been invaluable in medical missionary work.

Recognized as a physician of the highest rank and standards, his influence with his profession was invaluable in removing doubts concerning the value of popularizing health education. After the Child Health Organization program had grown up under his stimulating leadership, he enthusiastically joined with several directors of the American Child Hygiene Association, of which he had formerly been president, in bringing about an actual consolidation of these two great organizations in the American Child Health Association, of which Secretary Herbert Hoover is the president, and of which Dr. Holt served as first vice president from its beginning.

Dr. Holt was born on March 4, 1855, at Webster, N. Y., was graduated from the University of Rochester in 1875, took his master's degree three years later, and, in 1880, was graduated from the College of Physicians and Surgeons of Columbia University. Later, when his work had brought him fame, he received the honorary degrees of LL.D. from Rochester, and Sc.D. from Columbia and Brown Universities.

Dr. Holt's activities covered a wide field, but were devoted to a single interest. From 1890 to 1901, he was Professor of the Diseases of Children at New York Polyclinic, and from 1901, Clinical Professor in the Diseases of Children at the College of Physicians and Surgeons. At the time of his death, he was physician-in-chief at the Babies' Hospital, member of the Board of Directors and Secretary for the Rockefeller Institute for Medical Research, and Trustee of the University of Rochester. He was a member of the Association of American Physicians, retiring president of the American Pediatric Society, and a trustee of the New York Academy of Medicine.

He conducted important research on infant metabolism and was the author of a number of pediatric papers. His book on "The Diseases of Infancy and Childhood" has been the standard textbook in pediatrics in the medical schools of the country.

Though nearly seventy years old, he went to China in August, 1923, as special lecturer at the Union Medical College in Peking, an institution maintained by the Rockefeller Foundation. His death is a loss, not only to the nation, but to the world, whose children he made it his mission to save and serve.

DR. O. S. CHAPMAN

Dr. Ozias S. Chapman, one of the oldest physicians in Minneapolis, died Tuesday, February 5, 1924, at his home, at the age of 84 years.

During the Civil war Dr. Chapman had charge of a large military hospital at Cincinnati. He was a member of the George Rawlins post of the G. A. R., a member of the Hennepin County Medical Society, the Minnesota Medical Association and the American Medical Association, and was active in the work of the Congregational church.

Dr. Chapman was born in Niagara Falls, New York, on March 11, 1839. He received his primary and high school education at Lockport and came to the West when he was 18 years old. For a time he studied at the University of Minnesota, but his education was interrupted for some time by the Civil war. He was graduated by the Miami Medical college at Cincinnati and in 1867 moved to Kansas City, where he remained until 1873. In that year, because of poor health, he moved to Massachusetts, where he continued in practice until 1879. Later he went abroad and upon his return settled in Minneapolis in 1881.

Surviving are his widow, Mrs. Adelaide C. Hayward Chapman, two brothers, Edmund G. Chapman of Duluth, and Arthur A. Chapman of Pueblo, Colo.; two sisters, Mrs. M. L. C. Dunn and Miss Angeline Chapman, Minneapolis, and a niece, Miss Letah Chapman.

DR. H. B. CROMMETT

Dr. H. B. Crommett died February 6, 1924, at his home, Amery, Wis. Dr. Crommett is a graduate of the Medical College, University of Minnesota, in the year 1896. He first located at Montevideo, Minn., and in 1900 removed to Amery, Wis., where he had since practiced his profession.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

STATE MEDICAL MEETING

The annual meeting of the State Medical Association will take place October 8-10, 1924, at St. Cloud. The program committee consisting of the chairman and secretary of the Surgical Section, Dr. A. C. Strachauer, Minneapolis, and Dr. V. C. Hunt, Rochester, the chairman and secretary of the Medical Section, Dr. E. L. Tuohy, Duluth, and Dr. C. N. Hensel, St. Paul, and the secretary of the Association, had its first meeting February 13. The various problems in the arrangement of a comprehensive program were discussed. It was decided to arrange a program similar to previous state medical programs, affording an opportunity for members of the Association to present subjects in which they are particularly interested and which will be of interest to the members. Members are invited to send in to the secretary of the Association, 402 Guardian Life Bldg., St. Paul, the titles of subjects they desire to present. It will of course be incumbent on the committee to pick and choose in order to make up a well balanced program. Titles must be in the hands of the secretary by April 15. Prompt notification of acceptance or rejection will be made about May 15.

HENNEPIN COUNTY MEDICAL SOCIETY

Under the auspices of the Alpha Xi chapter of the Phi Delta Epsilon fraternity of the University of Minnesota, Dr. Morris Fishbein, a member, and associate editor of the Journal of the American Medical Association and of Hygeia, will speak at the regular Wednesday noon meeting of the Hennepin County Medical Society, March 19, 1924, in the library rooms in the Donaldson Bldg., on the subject of "Preparation of a Medical Manuscript." In the evening of the same day, and at the same place, Dr. Fishbein has consented to speak more formally and at greater length on the subject of "Medicine and the Press." This topic will be discussed by members of the medical and newspaper press. These meetings will be open to the medical profession in general.

THE MINNEAPOLIS SURGICAL SOCIETY

The regular monthly meeting of the Minneapolis Surgical Society will be held Thursday, March 6, 1924, at the Minneapolis General Hospital. Operative clinics will be held by Dr. J. F. Corbett, Dr. E. C. Robitshek, Dr. Olson, Dr. Lynch, Dr. E. Moren, Dr. S. R. Maxeiner, and Dr. A. A. Zierold. A luncheon will be served at the hospital at 12:30 P. M. followed by a pathological conference.

A dinner will be served at the General Hospital at 6:30 P. M. followed by the presentation of cases and a paper by Dr. Angus Cameron, of the University of Minnesota, on "Luetic Bursitis."

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

The annual meeting of the Southern Minnesota Medical Association will be held at Mankato, Minn., May 19, 1924. Members having papers they wish to present are asked to send the titles as soon as possible to the chairman of the program committee, Dr. H. W. Meyerding, Rochester, Minn. All communications regarding the program are also to be sent to Dr. Meyerding.

OF GENERAL INTEREST

Dr. W. C. Portman, of Jackson, is spending the winter on the west coast.

A son was born to Dr. and Mrs. D. N. Berkman of Rochester, January 29, 1924.

Dr. B. L. Laver, of Guy's Hospital, London, is spending several months at the Mayo Clinic.

Dr. and Mrs. C. A. Rathbun of St. Cloud are receiving congratulations on the birth of a son.

Dr. Otto Aagaard of Dr. Rovsing's clinic in Copenhagen is spending a month in Rochester.

Dr. C. H. Patterson, Barnesville, has been elected chief of staff of St. Ansagar's Hospital in Moorhead.

Dr. John A. Watson of Minneapolis is now medical and surgical counsellor at Mudbaden Sanatorium, Jordan.

Dr. Louis Faust, a Fellow in the Mayo Foundation, was married to Miss Elsie Eaton of Rochester on January 15.

Dr. C. J. Hutchinson, formerly of Rochester, has announced his connection with the Kenosha Clinic, Kenosha, Wisconsin.

Dr. H. F. Helmholtz was elected President of the Northwest Pediatric Society at the meeting held in St. Paul on January 31.

Dr. and Mrs. D. E. Seashore of Duluth have just returned from Miami, Florida, where they have been for the past month.

Dr. and Mrs. J. A. Freeborn of Fergus Falls are now in New York City, where Dr. Freeborn is taking a post-graduate course.

Dr. A. W. Adson delivered the Joyce Memorial Lecture in Portland, Oregon, on February 14. His subject was "Trifacial Neuralgia."

Mr. Perrin C. Galpin, Secretary of the Commission for the Relief of Belgium, visited the Mayo Foundation the latter part of January.

Dr. and Mrs. Arthur Steen of Cottage Grove, left the early part of February for Los Angeles, where they will spend the remainder of the winter.

Dr. A. E. Baldwin, who recently completed his internship at Phalen Hospital, St. Paul, is now engaged in the practice of medicine at Brownsdale.

Dr. Thomas O. Young, formerly of the Mayo Clinic, Rochester, has established offices in Duluth for the practice of surgery and surgical diagnosis.

Dr. J. W. Snyder, formerly of Rochester, has announced the opening of offices for the practice of general and thoracic surgery in Indianapolis, Indiana.

Dr. William J. Greenfield, formerly a member of the Mayo Clinic, Rochester, is now engaged in the practice of eye, ear, nose and throat work in Minneapolis.

Dr. Frederick Van Valkenburg, who recently completed his course in medicine, is now associated in practice with his father, Dr. B. F. Van Valkenburg at Long Prairie.

Dr. T. J. Kinsella, formerly a Fellow in the Mayo Foundation, and later connected with the Nicollet Clinic, was married to Miss Sara Monahan at Cedar Rapids on January 28.

Dr. Homer F. Swift, of the Rockefeller Institute for Medical Research, spent February 19 and 20 in Rochester and gave a Mayo Foundation Lecture on "Rheumatic Fever."

Dr. O. H. Ternstrom, formerly of St. James, is now located in Minneapolis for the practice of medicine. Dr. F. L. Bregel succeeds Dr. Ternstrom in his practice at St. James.

Dr. Emanuel Libman, Professor of Clinical Medicine, Columbia University, who visited the Mayo Clinic in January, gave a Mayo Foundation Lecture on "Endocarditis," January 22.

Dr. and Mrs. J. W. Meighen, of Ulen, are in New Orleans, where Dr. Meighen is taking a post-graduate course in the treatment of diseases of the eyes, ears, nose and throat.

Dr. F. G. Kohler of Hector has associated with him in the practice of medicine, Dr. Elton H. Smith of Minneapolis, who recently completed his internship at St. Barnabas Hospital.

Dr. Theodor Bratrud, Warren, is now in Boston, where he is doing post-graduate work. He will also take a course of study in New York before returning to Warren some time in April.

Dr. H. W. Froehlich, Thief River Falls, has been appointed a major in the Medical Officers Reserve Corps of the United States army. Dr. Froehlich has been a captain in the reserve corps for the past five years.

Announcement has recently been made of the appointment of Drs. Reuben Johnson and M. N. Moss of Minneapolis, as temporary assistants in medicine and obstetrics respectively, at the University of Minnesota.

Dr. L. M. Brunet, a practicing physician in Cloquet and Duluth, for the past fifty years, has retired from practice in that vicinity and is now located in Detroit, Michigan, where he will make his home with a daughter.

Announcement has been received of the marriage of Dr. C. E. Anderson, formerly of Minneapolis, now a practitioner at Garretson, S. D., to Miss Gracc P. Blake of Berlin, S. D., which took place at the home of the bride's parents January 15.

Dr. James K. Anderson, who has been in Pittsburgh for the past several months taking post-graduate work, has accepted the medical directorship of the Deerwood Sanatorium, Deerwood, where he entered upon his duties the latter part of January.

Dr. J. W. Andrews has severed his connections with the Mankato Clinic, of which he was one of the original founders, and will spend the winter on his fruit ranch in Florida. Dr. Andrews on his return to Mankato will resume his private practice.

Dr. Ogawa, Dean of the Medical School of the University of Kyoto, and Dr. Toda, of Okayama Medical University, who are making a survey of the principal medical schools of America and Europe, spent February 14 visiting the Mayo Foundation and Clinic.

Dr. B. C. Bernard, formerly a member of the staff of the Deerwood Sanatorium, is now superintendent and medical director of the Oakland Park Sanatorium, Thief River Falls, succeeding Dr. M. George Milan, who is now a staff member of the Warren hospital.

Dr. F. C. Schlutz, Minneapolis, has been appointed chief of the Pediatric Department and Professor of Pediatrics at the University of Minnesota Medical School on a full time basis. He will replace Dr. Rodda, who was appointed temporarily on resignation of Dr. Pirquet, who returned to Vienna.

Dr. and Mrs. W. J. Mayo left the first of February for

New Zealand and Australia. Dr. Mayo will attend the meeting of the Australasian conference of the British Medical Association in New Zealand, and will spend about six weeks visiting the various hospitals and universities in those countries.

Dr. E. Z. Shapiro of Duluth, in company with Dr. Charles Giesen of Superior, left February 6 for Vienna, where he will engage in research work. Dr. Giesen began his research work during the year 1914 but with the advent of the war was forced to return to this country. Both physicians will study at the University of Vienna.

"The Child Health Magazine" is the new name of the official publication of the American Child Health Association, which was formerly published under the name of "Mother and Child." The first issue of the new magazine, which is double the size of the former journal, appeared January 1, 1924. The magazine in its new form has an attractive typographical appearance and is fully illustrated.

Benjamin Franklin spent much time in England from 1757 to 1762 representing the American colonies. While there he placed one hundred pounds in the hands of members of the Society of Friends as a trust, to be invested with accumulations, for not less than one hundred and fifty years. Thereafter at the discretion of the trustees, awards were to be made from time to time for the most valuable contributions to science considered by them, either manuscript or published, on the subject of cures, but particularly in relation to surgery, the nervous system and the part "Mind Treating" has in the recovery and preservation of health. Announcement is now made of the first awards of this fund. *Minor award*, Fusakichi Omori of Tokio, unpublished treatise, "The Rotary Knife in Surgery," five hundred pounds and publication of treatise. *Award*, Charles P. Steinmetz of Schenectady, privately published treatise, "The Nervous System as a Conductor of Electrical Energy," one thousand pounds and republication of treatise. *Major award*, Pierson W. Banning of Los Angeles, published work, "Mental and Spiritual Healing; All Schools and Methods; A Text Book for Physicians and Metaphysicians," two thousand five hundred pounds, scholarship.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

ABBOTT LABORATORIES:

Potassium Bismuth Tartrate-D. R. L.

Ampules Potassium Bismuth Tartrate with Butyn-D. R. L., 0.1 gm.

Ampules Potassium Bismuth Tartrate with Butyn-D. R. L., 0.2 gm.

BRITT, LOEFFLER AND WEIL:

Loeflund's Malt Soup Stock (Dr. Keller's Formula)

HYNSON, WESTCOTT AND DUNNING:

Flumerin-H. W. and D.

LEDERLE ANTITOXIN LABORATORIES:

Corpus Luteum-Lederle
Corpus Luteum Extract-Lederle
Ovarian Residue-Lederle
1 Per Cent Silver Nitrate Solution-Lederle
Whole Ovary-Lederle

PARKE, DAVIS AND CO.:

Ergot Aseptic
Ampules Ergot Aseptic, 1 c.c.
Scarlet Red Sulphonate-P. D. and Co.
Scarlet Red Emulsion, 4 per cent-P. D. and Co.
Scarlet Red Ointment, 5 per cent-P. D. and Co.
Scarlet Red Ointment, 10 per cent-P. D. and Co.

NEW AND NON-OFFICIAL REMEDIES

Potassium Bismuth Tartrate-D. R. L.—A basic potassium bismuth tartrate containing from 64 to 69 per cent of bismuth. For a discussion of the actions and uses, see Bismuth Preparations in the Treatment of Syphilis (Jour. A. M. A., Aug. 25, 1923, p. 661). Potassium bismuth tartrate-D. R. L. is supplied only in the following forms: Ampules potassium bismuth tartrate with butyn-D. R. L., 0.1 gm. (containing potassium bismuth tartrate-D. R. L., 0.1 gm. suspended in 2 c.c. of a 0.6 per cent solution of butyn in a fixed oil); ampules potassium bismuth tartrate with butyn-D. R. L., 0.2 gm. (containing potassium bismuth tartrate-D. R. L., 0.2 gm. suspended in 2 c.c. of a 0.6 per cent solution of butyn in a fixed oil). The product is administered intramuscularly. The Abbott Laboratories, Chicago.

Scarlet Red Sulphonate.—The sodium salt of azo-benzene-disulphonic-acid-azobetanaphthol. The actions and uses of scarlet red sulphonate are essentially the same as those of scarlet R medicinal Biebrich (see New and Non-official Remedies, 1923, p. 275). It is marketed only in the following forms: Scarlet red emulsion, 4 per cent-P. D. and Co., scarlet red ointment, 5 per cent-P. D. and Co., scarlet red ointment, 10 per cent-P. D. and Co. Parke, Davis and Co. Detroit. (Jour. A. M. A., Jan. 19, 1924, p. 209.)

Ergot Aseptic.—A liquid extract of ergot containing the soluble constituents of the drug. It is standardized biologically so that 1 c.c. represents 2 gm. of ergot. The actions and uses of ergot aseptic are the same as those of ergot. The dose is 1 to 2 c.c. injected intramuscularly. Ergot aseptic is marketed only in 1 c.c. ampules. Parke, Davis and Co., Detroit.

Loeflund's Malt Soup Stock (Dr. Keller's Formula).—A preparation essentially similar to extract of malt, U. S. P., but containing a small amount of potassium carbonate. Loeflund's malt soup stock is designed for use in preparing the malt soup of Dr. Keller. Britt, Loeffler and Weil, New York. (Jour. A. M. A., Jan. 26, 1924, p. 303.)

PROPAGANDA FOR REFORM

Intarvin.—Because of numerous inquiries, the Council on Pharmacy and Chemistry publishes a preliminary report on Intarvin. The product is marketed by the Intarvin Company, Long Island City, N. Y. Dr. Max Kahn has applied for a patent on it. Many statements have been

given the lay press by those interested in the promotion of Intarvin, but as yet no publication has appeared in the medical press, except preliminary reports by Kahn. Intarvin is proposed for use in diabetes or in conditions where acidosis occurs. It is a synthetic fat which, it is claimed, can be assimilated by the diabetic without the production of products that cause acidosis, as is the case with ordinary fats when these are consumed by diabetics. Intarvin is stated to be the glyceryl ester of margaric acid admixed with ten to twelve per cent of liquid petrolatum. While the usefulness of Intarvin is curtailed by the discovery of insulin, it should be valuable in planning a diabetic diet if the claims made for it are substantiated. Intarvin is still in the experimental stage and it is unfortunate that so much newspaper notoriety has been given it. Until acceptable evidence is available for its usefulness, palatability and practicability, judgment of its worth must be suspended. (Jour. A. M. A., Jan. 5, 1924, p. 51.)

Firma-Chloro.—Firma-Chloro is marketed by the Chloro Chemical Corporation. According to the label, it is a mixture of chlorinated lime, tincture of iodine, picric acid, potassium chlorate, sodium bicarbonate and glycerin, but the amounts of the ingredients are not declared. The preparation is claimed to be a powerful chlorinated disinfectant. It is alkaline in reaction, hence the iodine which is claimed to be present would be converted to sodium iodide and sodium iodate. Altogether, the claimed formula is an impossible one: Firma-Chloro is another example of an irrational antiseptic. The favorite method of introducing Firma-Chloro is much like that used for "Oil of Salt" (which the A. M. A. Chemical Laboratory found to be essentially a mixture of linseed oil and essential oils, including turpentine, camphor and sassafras), namely, sending letters to manufacturing plants importuning them to have the product used in the first aid or medical department. (Jour. A. M. A., Jan. 5, 1924, p. 53.)

Chemical Foundation Wins.—During the late war, our government seized many German patents on synthetic drugs. Later the Alien Property Custodian, on executive order of President Wilson, sold 4,700 German chemical patents to the Chemical Foundation, Inc. This corporation agreed in turn to license any American firm that could present evidence of reliability in chemical manufacture to manufacture under these patents. As a result of this action, physicians may today obtain different brands of arsphenamin instead of one proprietary "Salvarsan"—and at competitive prices. The same is true of other useful synthetics. About a year and a half ago, President Harding instructed the Alien Property Custodian to take steps to secure the return of all patents sold to the Chemical Foundation, Inc., on the ground that the price paid was inadequate and the transaction illegal. Suit was instituted by the government against the Chemical Foundation, Inc., for the recovery of the patents. The suit was won by the Chemical Foundation, Inc. In the decision of the court, it was held that the price was adequate, for the reason that many of the patents were non-workable and that, therefore, because of the financial risk and hazard, the value of the patents "was too slight and problematical to warrant the payment by American citizens of a sum even remotely

approximating what they might have been worth to the German owners for their monopolistic purposes." Hence, the bill of complaint filed by the government was set aside. (Jour. A. M. A., Jan. 12, 1924, p. 130.)

Case's Rheumatism Cure.—Some years ago, Jesse A. Case was exploiting "Case's Rheumatic Specific" and an adjunct, a "Liver Tablet." This was a fraudulent mail-order quackery and was finally put out of business by the Post Office Department. Now, Paul Case, son of Jesse A. Case, advertises in newspapers that he has a wonderful rheumatism prescription which he is willing to give free. Those who write receive prescriptions which are strikingly similar to the preparations used by Jesse A. Case. However, the prescription of Paul Case starts out with a "Joker" that was not in the prescription of his father. This is "Powdered Gadoeng (Java)." When sending the prescriptions, Case states that best results are obtained with Genuine Gadoeng—and offers to supply the remedies at a moderate price. Gadoeng is a name for *Dioscorea hirsuta* (a plant related to the obsolete American drug, Wild Yam), which grows in Java and is not found in drug stores. Hence, druggists cannot fill the prescription, and those who want the medicine must get it of Case. (Jour. A. M. A., Jan. 12, 1924, p. 145.)

The Action of Salicylates, Cinchophen, Neocinchophen and Related Products.—The latest (1923) edition of Useful Drugs speaks of the salicylates, cinchophen, neocinchophen and related drugs as "highly efficacious" and "exceptionally efficient" in the management of certain phases of arthritis. The assumption that the drugs exert an etiotropic action by destroying bacterial agencies responsible for the disease has repeatedly been disproved. They do not function as germicides, for example, in rheumatic fever assumed to be caused by micro-organisms. Recently, Hanzlik and Painter compared the antiphlogistic effect of salicylates, cinchophen and neocinchophen in experimental edema of head and neck. They concluded that the so-called antiphlogistic action of these drugs as exemplified in the prompt amelioration of objective signs of inflammation, including the swelling and edema of the joints, is not due to a direct action on the inflammatory process. Experimental edema of the head and neck in animals was not beneficially influenced by previous and simultaneous treatment of the animals with sodium salicylate, cinchophen, or neocinchophen. Negative results with respect to antiphlogistic effects have also been observed in the treatment of other kinds of edema. Consequently, it is concluded that the beneficial effects of these drugs in rheumatic fever appear to be produced neither through etiotropic nor organotropic, but rather through symptomatic action, the benefits being mediated through antipyresis and analgesia. (Jour. A. M. A., Jan. 19, 1924, p. 213.)

Diphtheria Antitoxin for the Infant.—In the presence of diphtheria, no age is a contraindication to the administration of antitoxin. The dose for infants of from 10 to 30 pounds and under two years of age has been given as from 2,000 to 10,000 units. The immunity to diphtheria in young infants seems to depend on antitoxin received from the mother through the placental circulation. This immunity is possessed by more than 90 per cent of the children in

the early weeks of life, but at the end of a year this has been lost by about half of them. Serums are well borne by young children, as they have little sensitiveness to foreign proteins. A suitable immunizing dose of diphtheria antitoxin for an infant would be from 200 to 500 units, and the therapeutic dose from 2,000 to 10,000 units. (Jour. A. M. A., Jan. 19, 1924, p. 228.)

Dermatosis From Fur.—Reports have been published of persons who have suffered severe eruptions and irritations of the skin following the wearing of furs. Investigation has shown that these disturbances are caused by paraphenyldiamin, which is used to dye furs black, and by quinone, an oxidation product of paraphenyldiamin, which gives a brown color. The untoward effects may be prevented largely by extreme care in the finishing and dyeing processes, with special attention to remove all excess dye, and particularly traces of quinone from the fur. (Jour. A. M. A., January 26, 1924, p. 307.)

Spectro-Chrome Therapy.—Colonel Dinshah P. Ghadiali is the exponent of "Spectro-Chrome Therapy" and founder of the "Spectro-Chrome Institute." According to a "life sketch" sent out by him, he was born in India, attended a primary school when he was 2½ years old, was in high school when he was eight years old and at the age of 11 acted as assistant to a professor of mathematics and science at Wilson College, Bombay. Since then he claims to have had a remarkable and varied career. "Spectro-Chrome Therapy," we are told, is "The Latest Revelation in the Healing Art." It consists in "the restoration of the healing Radio-Active and Radio-Emanative Equilibrium by Attuned Color Waves." Here is the thesis developed and commercialized by Ghadiali: Every element exhibits a preponderance of one or more of the seven prismatic colors; 97 per cent of our body is composed of the four elements, oxygen, hydrogen, nitrogen and carbon. The preponderating color waves of these four elements are blue, red, green and yellow, respectively; the human body is responsive to these four "color wave potencies." In health our four colors are properly balanced. When they get out of balance we are diseased; ergo, to cure disease, administer the lacking colors or reduce the colors that have become too brilliant. These cures are to be produced, of course, by means of paraphernalia which Ghadiali supplies. He gives a course in "Spectro-Chrome Therapy." At the end of the course, which seems to last two weeks, a diploma is granted. That this "cult" is taken seriously by some is shown by the published testimonials of cures said to have been wrought. Hopeless and credulous patients are being treated for such serious conditions as syphilitic conjunctivitis, ovaritis, diabetes, neuritis, pulmonary tuberculosis and chronic gonorrhea, with colored light. (Jour. A. M. A., Jan. 26, 1924, p. 321.)

Effect of Bromids on Epilepsy.—The harmful effects of the prolonged administration of bromides aside from the skin and intestinal effects, are gradually increasing dullness, heaviness, torpor, stupidity, with greater self-centering of interests and unintelligence. The size of the dose that is necessary to control the fits is probably an important factor in determining the amount of damage that will be done. (Jour. A. M. A., Jan. 26, 1924, p. 325.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

MEETING OF JANUARY 9TH, 1924

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, January 9th, 1924, at 8 p. m. Dr. H. P. Ritchie, Vice President, presided. There were 22 members and 1 visitor present.

Prof. R. E. Scammon was elected to honorary membership in the Academy.

The following members reported cases:

1. DR. C. E. RIGGS (St. Paul): Preliminary remarks. For forty years I have met at different times three grave infections of the central nervous system—epidemic cerebrospinal meningitis, infantile paralysis and encephalitis lethargica. The latter name, given by Economo, is unfortunate because 20 per cent of the cases are not lethargic. These three infections have one thing in common: they occur sporadically. For twenty-five years I was on the staff of the City and County Hospital and every spring I expected to see, and was not disappointed in seeing, sporadic cases of cerebrospinal meningitis. I had a similar experience with infantile paralysis and the same is equally true of epidemic encephalitis.

I wonder how much any of us know of the occurrence of epidemic cerebrospinal meningitis fifty or sixty years ago. I recall hearing an old practitioner tell his experience; he and a confrère were practicing in northwestern Ohio and for three weeks during an epidemic he did not have his clothes off. He bled his patients; his confrère purged his; and about the same number died in each instance.

These three diseases have their periods of epidemic influence and it is during the interim that the sporadic cases occur. I think it is pretty well established that as far as two of these infections are concerned—epidemic cerebrospinal meningitis and infantile paralysis—the microbic agent is known. The disease called Australian X is clinically and histologically similar to that of infantile paralysis, and according to Flexner is "an exalted form of epidemic poliomyelitis," but when it comes to encephalitis lethargica, as to the microbic agent the bacteriologists are still at sea.

The most notable work in this line has perhaps been done by the members of the Sinai Hospital staff. They believe they have produced experimental encephalitis and that the globoid organism that they have observed is the inciting cause. These findings, according to Flexner, have never been confirmed except by Thalheimer of Milwaukee. Levaditi and Harvier, McIntosh and Turnbull, Doerr and an associate, Schnabel, have, they believe, experimentally produced encephalitis. Experiments, however, carried out by Flexner and Amoss for a period of four years "failed constantly to yield an unequivocal result."

Febrile herpes may cause an infection that manifests characteristics very similar to those of experimental encephalitis. Expert bacteriologists postulate an identity

between the two processes. While it would appear that laboratory workers are at variance regarding the etiologic agent that causes epidemic encephalitis and the solution of this problem is not yet an accomplished fact (Flexner), the disease is still with us. Its symptomatology is startlingly protean, exceeding that even of syphilis. Last winter we experienced in the Twin Cities a serious epidemic. This year it appeared much earlier (I observed my first cases in October). It is most atypical and most virulent. In one of my patients it simulated an involuntal melancholia and in another it grafted itself on an essential epilepsy, this patient dying with a temperature of 108 degrees.

This evening I wish to report a case of a disorder of personality, arising in one of my patients, suffering from encephalitis lethargica.

Miss E., 17 years. Mother died of pulmonary hemorrhage; father living and well; three brothers and one sister died in infancy; one brother and one sister living and well. Infantile paralysis at 10 years; recovered in five months. Shortly after she developed Sydenham's chorea. This lasted three months. Seven years ago she had an attack of acute articular rheumatism. Has been nervous at times ever since. At these periods it has been difficult to talk. Had an attack of lethargic encephalitis one year ago last spring; was in bed three weeks; was markedly lethargic; would arouse if spoken to, stay awake 15 minutes or so and again fall asleep. Ten days ago tremor was first noticed in right arm; this extended to the right leg, then to the left arm and leg. When she consulted me she was apathetic, took no interest in things and was unable to concentrate mentally. Last June she developed nervous spells, complained of feeling faint; apparently would drop off to sleep; breathing short and quick. If hands or feet were lifted they would fall back as if lead. No change in color in face. These seizures lasted from 20 minutes to several hours in duration. The attacks varied in frequency from one to three in 24 hours and usually occurred on afternoons. Occasionally the seizures would occur in the early afternoon and continue during the night. She would hold her breath in some spells for two minutes; sometimes she would start talking as soon as the attack came on and might continue doing so for three or more hours until the spell passed off. In her conversation she described in detail journeys she never made (fabrications); again she would imagine that she was at a hospital at the front, where she was assisting the doctors and nursing shell-shocked soldiers. Then again she would think of herself as a missionary and would tell Bible stories; she would also quote passages from the Bible and tell where such passages would be found. Her citations as to the passage and place were correct. During these attacks she would frequently hold her hands to her ears and would cry out in terror, "there is another shell," and tremble all over. Then she would fold her hands in prayer, praying for the soldiers and herself. Frequently she would narrate occurrences that had occurred in her own life and usually her descriptions were accurate. This patient was fond of basket-ball and during some of the attacks she was evidently witnessing a game. She would first tell the names of the players; if her friends won a score she would clap her hands vigorously, talking constantly; if they lost she showed her great disappoint-

ment. At times during the progress of the game she would give utterance to the high school yell. Generally in coming out of an attack she would twitch and shake all over. There was no recollection of what she said or did during an attack with the exception of the last few spells, of which she had a confused memory. At times one or both legs would draw up; the leg flex on the thigh and the thigh flex on the abdomen. Occasionally, the arms and legs and whole body would become rigid. At these times she would hold her breath and the right leg would be extended and rigid.

Physical examination showed aortic and mitral insufficiency, moderate myocardial insufficiency and moderate dilatation to the left. There was a mild residual arthritis of wrist, ankle and knee joints.

The neurological examination was negative. Hemoglobin 88 per cent. Blood pressure 130 systolic, 80 diastolic. Urine negative. Serological findings negative. She experienced marked relief after the first lumbar puncture, the attacks greatly diminishing. After an intraspinal injection of auto serum, they were much increased for a week; then practically ceased.

Clearly, this is a case of encephalitis lethargica, with an associated disorder of personality. For the latter, for the want of a better name, we use the archaic term hysteria. Recently Hunt has called attention to this rather unusual association. Hysteria, neurasthenia, and psychasthenia—the so-called psychoneuroses—are not diseases, only syndromes, clinical ensembles as it were, due to the influence of mental stress, physical illness or both on personality—they tend to disintegrate, to disorder it; in fact, the whole gamut of nervousness or nervous manifestations are just so many expressions of their disruptive effect on its normal integration. The functional nervous diseases of forty years ago and the psychoneuroses of a later evolution are now in the discard. They have been touched by the magic wand of the new psychology and are no more—we now marvel at the immaturity of our former concepts.

In the disorders of personality we now find a scientific, a more satisfactory explanation. The struggle of personality within itself, i.e., the inherited instincts versus our acquired experiences; its struggle with the industrial, the social and the moral order; its inherent initial defects; the disruptive influence of mental stress or grave physical illness, or both combined; these constitute the ordeal through which personality in the making must pass in order to become stabilized and normal and it is while passing through this crucible that all these protean nervous and mental symptoms arise. Goethe truly says:

"Two souls, alas, reside within my breast,
And each from the other rends and tears itself."

2. DR. A. C. STRACHAUER presented two cases:

(a) A case of chronic indurated gastric ulcer present since the age of 8 years, treated by excision and posterior gastroenterostomy.

Norvald N., age 11 years.

Complaint: Epigastric pain, nausea, vomiting, and undernourishment.

History: Patient admitted to the University Hospital on Nov. 14, 1923, complaining of epigastric distress, nausea,

vomiting, and loss of weight and strength. Symptoms had developed suddenly three years ago, and consisted of severe epigastric distress coming on about 2 hours after eating, followed in half to three-quarters of an hour later by nausea and vomiting. Vomiting always gave complete relief. Such symptoms might occur as often as twice daily or be absent for several days. The patient found nothing which would relieve the pain except emptying the stomach. Periods of such attacks occurred intermittently but with increasing frequency. The longest interval of freedom from distress since the onset of his illness was 5 weeks. Gradually he began to lose weight. His appetite became poor; he felt weak and listless, and finally was taken from school. Six months ago the pain began to subside. Vomiting persisted and occurred every two or three days. The parents noticed that food eaten the day previous would often be vomited the next day. He continued to lose weight and strength. He had never vomited blood nor, as far as can be ascertained, passed blood in the stools.

Examination at the time of entrance showed an emaciated, under-developed boy, weighing 43 pounds, with no abnormal physical findings except very carious teeth, moderate cervical adenopathy and epigastric distention, in which peristaltic waves could be plainly seen moving across the abdomen to the right. Abdominal palpation negative.

Fluoroscopy of the stomach showed enormous dilatation, atony and complete retention of the barium meal at the end of 6 hours. Findings were conclusive for pyloric obstruction, but did not differentiate between ulcer or congenital stenosis.

While in the hospital he had no fever. He complained of no pain, but unless aspirated daily he refused his food because of a feeling of distention. Routine aspirations each morning varied from 600 to 1,300 c.c. Retention was not relieved by milk and cream diet with acidity controlled by alkalis. Patient gained three pounds while in the hospital.

Laboratory findings:

Gastric content:

Free acid varied from 14 to 35 points.

Combined varied from 37 to 56 points.

Urine—normal.

Stools showed no occult blood.

Hemoglobin, 90 per cent.

Leucocyte count, 10,700.

Polymorph., 79 per cent.

Lymphocytes, 12 per cent.

Wassermann negative.

Von Pirquet negative.

Pre-operative diagnosis:

1. Ulcer.

2. Congenital pyloric stenosis.

Treatment: Ether anesthesia. The abdomen was opened by a right rectus incision, disclosing the stellate scar of a gastric ulcer, the size of a dime, on the anterior wall of the stomach, three-quarters of an inch from the pylorus. On palpation a crater could be felt which readily admitted the tip of the little finger. The stomach wall, over an area the size of a quarter, was markedly thickened.

The ulcer was excised, being one centimeter in thickness, and because of almost complete obstruction at the pylorus a posterior gastroenterostomy was performed.

Pathologist's report: Gross specimen consisted of an excised area of stomach wall measuring $2\frac{1}{2} \times 2\frac{1}{2} \times 1$ cm. in thickness. It showed an induration of stomach wall consisting of firm, fibrous connective tissue. The mucosa showed a definite crater-shaped ulcer measuring 5×7 mm.

Microscopic report: Section of the ulcer showing the thickened stomach wall to be made up of dense fibrous connective tissue with very small blood vessels. This tissue contained a few lymphocytes. The mucosal surface showed a break in continuity corresponding to the area of ulceration described in the gross. **Diagnosis:** Gastric ulcer. (John F. Noble, M.D.)

Subsequent history: Patient made an uneventful recovery and was sitting up on the tenth day after operation.

(b) A case of hydronephrosis in infancy.

Elmer D., age 16 months. Complaint: Abdominal tumor and dyspnea.

History: The patient, a well-developed, well-nourished male infant, was admitted to the University Hospital on December 4, 1923. He weighed 26 pounds, and, except for the abdominal swelling and dyspnea, was apparently in excellent health. Delivery was normal; he was breast-fed for four months. Teeth erupted at normal intervals, and he began to walk at one year. The abdomen was unusually large at birth, and it gradually increased in size. At one year, when he began to walk, dyspnea was noticed. At the same time the swelling became more prominent on the left side and for the first time a soft, fluctuant mass was made out. This became uniformly larger, until at the time of his entrance to the hospital it occupied almost the entire left side of the abdomen. It was never painful. There were no abnormal urinary symptoms.

Examination: A large, soft mass occupied the entire left side of the abdomen from the costal margin to the brim of the pelvis. It imparted a definite fluid wave and moved toward the midline when the abdominal muscles were used. Circumference of the abdomen at the umbilicus was 24 inches, and the same at a level 2 inches higher. A cystic, elastic tumor mass could be felt by rectal palpation. Examination otherwise negative.

X-ray examination: Fluoroscopic examination of the colon showed the splenic flexure and descending portion to be markedly displaced to the right, toward the midline.

Laboratory findings:

Urine normal.

Hemoglobin 70 per cent; red cells 3,640,000; leucocyte count 7,200.

Wassermann negative.

Clinical diagnosis:

1. Congenital hydronephrosis.
2. Mesenteric cyst.

(Because of the patient's age and sex it was not deemed advisable to submit him to cystoscopy and pyelograms. Cystoscopic examination in girl infants is easily performed, but boy infants are liable to traumatization and are to be cystoscoped only under the greatest urgency.)

Treatment: Ether anesthesia. Left rectus incision. The descending colon was mobilized, and an enormous hydronephrotic kidney removed by the transperitoneal route.

Pathologist's report: The specimen consisted of a large hydronephrotic kidney. The entire specimen measured $17 \times 13 \times 11$ cm. The kidney was flattened and thin to form part of the wall of the dilated pelvis and was 16×9 cm. The ureteral pelvic juncture was located at the medial border of the mass and slightly anterior. There was a definite constriction at this point. The dilated pelvis was vascular and the renal vessels entered at the medial border and ran adherent to the wall of the sac to reach the kidney.

Subsequent history: The patient made an uneventful recovery and was discharged from the hospital 16 days after operation. At the time of his discharge the abdomen measured 21 inches in circumference at the level of the umbilicus.

Comment: Congenital hydronephrosis is still rare enough to be of interest when found. A review of the literature discloses 120 reported cases. Approximately three-fourths of the cases are discovered soon after birth, and as time passes the cases which are encountered are less likely to be of true congenital origin.

Most of the reported cases have been unilateral. Stricture of the ureter has been a common cause. The locations of the strictures are at three principal sites: the ureteral pelvic juncture, the level of the brim of the pelvis, and at the ureteral vesical orifice. Twenty to forty per cent of strictures, varying with the series reported, are at the ureteral pelvic juncture and the remainder are at the lower end of the ureter, most commonly at the ureteral vesical orifice.

The following pathological findings have been reported:

1. The presence of fetal folds persisting to form valves or actual constrictures of the ureter.
2. Anomalous vessels causing kinking of the ureter to produce obstruction.
3. Intrauterine inflammatory reactions causing fibrous strictures.
4. Failure of development of all or part of the ureter. (Engelisch has reported 8 cases in which one or both of the ureters are entirely absent.)
5. Anomalous positions of the ureter entering the vagina, uterus or bowel.

There have been a few cases of probable congenital origin in which hydronephrosis and hydroureter have been found without constriction at any point. The etiology of such conditions has been explained by

1. Disturbance of nervous mechanism in which there is a spasmodic contraction of the internal vesical sphincter occurring coincidentally with powerful contraction of the bladder and resulting in back pressure in the ureter and pelvis of the kidney.
2. Inflammatory reaction with erosion of the ureteral vesical orifice destroying the valve action and allowing back pressure from the bladder.
3. A congenital failure of the development of ureteral musculature.

Congenital hydronephrosis must be differentiated most

commonly from mesenteric cyst, ovarian cyst, enlarged spleen, pancreatic cyst and megacolon.

Symptoms consist of abdominal swelling in which a definite mass can usually be made out. Frequency, painful micturition or retention are occasionally found, and in such cases the stricture causing the hydronephrosis is usually at the ureteral vesical juncture. Bottomley reports 17 cases in which a fibrous constricted ureteral vesical orifice projected several mm. into the bladder. All of these cases show some bladder symptoms.

Where cystoscopy, ureteral catheterization and pyelograms are feasible, as in female infants, a positive diagnosis can usually be made.

The transperitoneal route has been the favored method of approach.

In cases of bilateral hydronephrosis, some form of plastic operation must be attempted, but the prognosis in such cases is very poor.

DISCUSSION

DR. A. SCHWYZER: In connection with the case of congenital hydronephrosis, I thought of a case that was very interesting in the obstetric service which I saw when I was assistant in the University Hospital in Zurich. When I was called in to see the case the second assistant had pulled out the arm of the child when he tried to make a version, and he had torn the arm and shoulder-blade clear off. The arm was edematous. I told him right away it was an anomaly and would never have lived. In examining, you felt a soft ballooned mass. With the finger-nail I ripped an opening and relieved a lot of fluid in that way. Then a second sac presented inside of the first one and was emptied in a similar way. This was the bladder. Every part of the child was edematous. This case was due to impermeability in the urethra of the child.

DR. JUDD (Rochester): These are certainly two very interesting cases. I had one case last year of an ulcer on the lesser curvature of the stomach. The patient was a boy 13 years old with a history of 2 or 3 years. It had not produced quite as marked symptoms as this one, although the ulcer was considerably larger than this one. I had the boy on Sippy treatment for two or three months and finally did just as Dr. Strachauer did. I think that is the youngest case we have seen of ulcer of the stomach.

I had a case of congenital hydronephrosis, a child 5 or 6 years old. We have laid so much stress in these cases on constriction of the ureter, but it seems to me that with the picture of this amount of destruction in the kidney tissue there must be some disease in the kidney itself. The kidney substance was pretty well destroyed, yet there was no evidence of obstruction. It seems to me we have not yet gotten at the etiology of hydronephrosis.

3. DR. LITZENBERG showed x-ray pictures of a hairpin which had been introduced into the uterus by the patient and which was removed by vaginal hysterotomy.

4. DR. JUDD (Rochester) reported two cases:

(a) Cyst of the Liver. 412606. M. A. B., male, 4 years of age.

History: The child was brought to the clinic Dec. 11, 1922. He had always been perfectly well until two weeks

previously, since which time he had frequently cried out in his sleep and complained of pain in his stomach. Never a hearty eater, but had never previously complained of any discomfort. No fever or jaundice. No known injuries of any kind.

Examination: Well-developed but rather thin, sallow boy. Submerged septic tonsils. Cervical glands enlarged. Reflexes exaggerated. Palpable mass 8x8.5 cm. in diameter in the epigastrium, movable in all directions. Lambia intestinalis and trichonemads present in stools. X-rays of the gastrointestinal tract negative. Hemoglobin 68 per cent; white cells 16,000; red cells 4,200,000. Urinalysis showed a specific gravity of 1045 and the presence of a slight amount of albumin. Blood Wassermann negative.

Operated Dec. 18, 1922. Tumor about the size of a small grapefruit beginning just beyond the suspensory ligament and involving the left lobe of the liver. Liver incised and cystic mass removed without rupturing it. Individual vessels tied and liver carefully sutured together. The tumor mass proved to be a multilocular simple cyst weighing 260 gms. Convalescence uneventful and patient able to leave the hospital the 13th day and was dismissed from our care 4 days later.

Examined Jan. 5, 1924: Patient had been crying out in his sleep during the past two or three weeks (period of holiday celebrations). When thoroughly awakened, the child did not complain of pain. Hemoglobin 72 per cent; white cells 12,000; red cells 4,650,000. No demonstrable abdominal pathology.

Discussion: This particular case is interesting because of the rarity of the condition and because it shows that a rather extensive operation on the liver can be carried out in a young child.

An accurate diagnosis of the condition could hardly be possible, as there were no indicative symptoms, simply the presence of a tumor. In most instances, the simple cysts of the liver have been multiple and have been associated with multiple cysts in the kidneys. Usually the cysts in the kidneys are extensive and their interference with the renal function may be the only complaint these patients make; there may be no palpable cysts in the liver. In this reported case, the liver was carefully examined and no other cysts could be found. The patient was examined recently, more than a year since his operation, and from all the evidence we could obtain, he is free from cysts in the liver or kidneys, and is well.

(b) Pancreatic Cyst. 392950. A. K., female, single, 54 years of age.

History: The patient came to the clinic May 30, 1922, because of the discovery of a tumor in the epigastrium two weeks previously. No pain or other symptoms from it. Had been constipated for many years. Five years previously she had had a sterile pleural effusion necessitating two drainage operations; in April, 1922, she had had a right-sided pleurisy confining her to the hospital for 10 days. For three or four years she had had marked intolerance of greasy foods and sauces, but no colic or jaundice. No weight loss.

Examination: Negative with the exception of a palpable mass in the epigastrium the size of an orange, which

moved on respiration. Low-lying but normal right kidney. Thickened pleura.

Operated June 13, 1922. Cyst of the pancreas near the head on the upper border with attachment about 3 inches in length, extending more on the posterior than on the anterior surface of the organ. The mass lay in the lesser peritoneal cavity just above the stomach and under the left lobe of the liver. A left rectus incision was made and the cyst enucleated by careful dissection without rupturing it. The pancreatic tissues were clamped superficially so that the ducts were not injured in any way. The abdomen was closed without drainage.

Discussion: In this instance the cyst was different than any other pancreatic cyst we have ever observed. In all the others, the cyst has been situated in the substance of the pancreas. The pancreatic tissue surrounded the cyst and an attempt to enucleate the cyst would have produced a great amount of bleeding, and rather than resort to excision under these circumstances, it has seemed a better policy to drain the cyst, suturing the wall of the cyst to the parietal peritoneum, thereby establishing drainage over a considerable period of time. These cases have done very well, although drainage in some individuals has persisted for a long time, sometimes many months.

In the case reported, the cyst probably should have been classified as a pseudo-cyst, as it was lying between the lesser curvature of the stomach and the liver and apparently arose from the extreme upper border of the pancreas. The entire cyst could be lifted out of the abdominal cavity and by clamping a few small attachments was removed. After these attachments had been tied off, the abdomen was closed without drainage. In every other respect the tumor was characteristic of a pancreatic cyst.

DR. H. B. SWEETSER read a paper entitled "Observations on Carcinoma of the Colon," with report of two cases.

DISCUSSION

DR. STRACHAUER: Malignancy of the bowel is one of the most satisfactory fields in surgery. Carcinoma of the bowel usually grows slowly and is very late to metastasize. Our operability of cancer of the bowel has been very much higher than has been reported by Dr. Sweetser. In fact, in our experience at the University Hospital, it has been the very rare exception that a tumor of the colon has been non-resectible. As to the types of operation to be performed, the indications for the Mikulicz and other types of resection are quite definitely laid out. All tumors of the right colon, that is the cecum, ascending colon and hepatic flexure, are preferably operated upon by the removal of the terminal ileum, cecum, ascending colon and hepatic flexure, an anastomosis being made between the ileum and transverse colon and the abdomen closed without drainage. The Mikulicz operation is indicated in all tumors of the left colon; that is, the transverse colon, splenic flexure, descending colon and sigmoid.

Primary anastomosis in the left colon is too frequently followed by leakage to warrant its performance. The Mikulicz operation is one of the safest and most satisfactory operations we are called upon to perform. By ade-

quate mobilization of the colon a very wide resection of the bowel and mesentery may be effected.

The account of a recent case operated upon at the University Hospital may be interesting. The patient complained of pain in the lower left abdominal quadrant two hours after meals. On palpation a tumor the size of a man's fist could be palpated in this region. At operation a carcinoma of the cecum, which had become adherent to the mesentery of the sigmoid, with extension of the malignancy into the mesentery of the sigmoid, was disclosed. A resection of the terminal ileum, cecum, ascending colon, and hepatic flexure with its fan-shaped mesentery, was performed and an end-to-side anastomosis made of the ileum to transverse colon. The sigmoid was freely mobilized and 14 inches of the same removed by the Mikulicz procedure.

These operations were done through a lower left rectus incision. When necessary to close the colostomy we have found that the same could be more easily performed by including in the closure a margin of the skin. In addition to this method of closure on the human, colostomy in a number of dogs was similarly closed, and we found, after killing the animals and removing the bowel, that the skin was still living and the hair growing into the lumen of the bowel.

DR. A. SCHWYZER (St. Paul): In regard to the diagnosis, I want to mention two cases we have had within a month. One was not carcinoma, but it was interesting as to the diagnosis; it was similar to that Dr. Sweetser has reported. The physician was not urging the operation, because the symptoms did not appear very urgent, and also on account of the patient's age. He had found that the lady, 68 years old, was suffering besides the constipation from insufficient action of the kidneys and weakness and fainting spells. However, there was a mass to be felt on deep palpation in the region of the upper ascending colon. It is difficult to understand why there was not a complete obstruction. There was at least 3 inches of an ulcerated and tortuous narrow channel through a thick carcinomatous mass larger than a man's fist. When water was poured into the cecum and the specimen held vertically suspended, the water would not run through this channel, but stay in the cecum above. An ileo-colic anastomosis was made after removing the whole mass under local anesthesia with $\frac{1}{4}$ per cent novocain. The patient stood the local anesthetic quite well. She had broad adhesions and we had to remove a large package of glands that reached toward the root of the mesocolon. These glands, if they are soft and round and discrete, are as a rule only inflammatory and they felt inflammatory. Nevertheless, they were removed. The microscope showed they were only inflammatory. Just as Dr. Strachauer has found, I have seen few cases that really were inoperable. Not only when the lesion was in the right half of the colon but in almost every case I have made a direct anastomosis. One must always be careful not to drain near the suture line, and we use linen or silk on the outer side. I have done the Mikulicz operation in very debilitated old people. The upper part above the tumor is usually enormously hypertrophic. In this mentioned case, it was enormously so, and I think that was the reason why the patient did not have complete blocking.

The other case we had two weeks ago today. A woman, about 45 years of age, was brought in with complete obstruction. I have rarely seen an abdomen as tense as that one. The obstruction had lasted only two days. She had had repeated doses of laxatives, and seven enemas, with no results. In examining her vaginally, it was noticed that she had a hard mass at the right side in the Douglas. It seemed that it probably was a carcinoma above the rectum. It was thought best to first do just a small ileostomy through a gridiron incision at McBurney's point. We found absolutely collapsed small intestines. No ballooned loop presented. In feeling over toward the left side we found a very tense elastic mass. On its anterior surface we could feel a spread-out tinea, nearly an inch wide. This proved to be the colon. A midline incision was made and an enormous sigmoid was delivered. There was a twist of 360 degrees on the sigmoid flexure and the hard mass in the pelvis was a sub-serous fibroid of the uterus, which we removed. We put the lower part of the sigmoid on the stretch and then sewed it to the parietal peritoneum for a distance of about four inches.

The postoperative course in both cases was quite smooth.

DR. JUDD (Rochester): There is one thing I would like to state again, to emphasize: the thing that we are constantly confronted with in a patient coming in with obscure abdominal symptoms. We have an x-ray of the colon and find carcinoma. These tumors may develop in an obscure way and grow to be very large before they give any evidence of lesion of the colon. Our experience with resection would be about the same as Dr. Miller at Hopkins. In operating for carcinoma of the right colon it seems to be a pretty radical procedure. You can very easily take out a segment and make an end-to-end or lateral anastomosis. It is safer to take out the coil and then join. I like to do an ileostomy at the same time. I used the Witzel technic; I put a catheter in and put a clamp on it. If there is no distention and the gas is expelled without difficulty, it may never be necessary to release the clamp from the end of the catheter and it may just be left in place until the catheter comes out of its own accord, in about 10 days. On the other hand, if there is distention, nausea, vomiting or paresis, it is well to free the clamp from the catheter and allow the gas and liquid feces to escape. This usually greatly relieves the patient. In the cases in which we have not used the catheter, it is seldom necessary to do a secondary operation for obstruction or paresis, but some patients have been distended a good deal and very sick for a number of days. This can be entirely relieved by the use of the enterostomy.

With carcinoma of the left colon, I think, as Dr. Strachauer says, they do represent a fairly satisfactory class, but they are primarily a big hazard and represent a higher mortality than the other resections. This has led us to do practically all cases in two stages. The patient may get along apparently all right for a week and then develop peritonitis, which it seems to me is explained by the fact that the circulation in the left colon is definitely distributed in segments. In one case the circulation may not seem to be greatly disturbed and the case gets along well, but in another case apparently done just as accurately and giving the same appearance at operation, the circulation

to one of the segments may be poor and the patient die as a result of necrosis in this portion of the intestine. In resections of the left colon, it seems to me the better plan is to do a radical Mikulicz operation if it can be done. With low tumors, it is sometimes very difficult to get the growth out well.

In operating for obstruction, it is better to do a complete ileostomy or a colostomy first, so that at the time of the second operation there will be practically a clean field. The colostomy enables us to wash out the lower segment and the performance of a clean operation.

DR. STRACHAUER: Dr. Judd's description of the blood supply to the colon is an explanation only in part for the failure of the colon to heal in primary anastomosis. We must recall that the colon is only partially covered by peritoneum and is not surrounded by a complete investiture as in the case of the intestine. Successful anastomosis of the bowel is absolutely dependent upon the apposition and adherence of serosa to serosa. This can not be accomplished in the posterior portion of the colon, which lacks the peritoneal covering. This, in addition to the blood supply, is the explanation of the common occurrence of leakage following resection and immediate anastomosis.

DR. SWEETSER (in closing): I just want to add a word. Of course, we understand that resection of the bowel for carcinoma carries with it a certain mortality which cannot be avoided by any method of operation. If, now, the mortality from resection and preliminary colostomy is no greater than that from the Mikulicz or two-stage operation, then, surely, from the standpoint of the patient, the former is the preferable method, as it gives a shorter and less distressing convalescence. That there is little difference in choice as regards mortality in the two methods may be seen by comparing the results in the respective series of Dowd and of Miller. Dowd had one death in 8 cases done by the Mikulicz two-stage method, a mortality rate of 12½ per cent; and Miller reports one death in 13 cases done by resection with preliminary colostomy, a mortality rate of 8 per cent.

DR. F. L. ADAIR read a paper entitled "Placental Infarcts and Their Relation to the Toxemias of Pregnancy," illustrated by several lantern slides.

DISCUSSION

DR. CONDIT: I would like to ask Dr. Adair how much of the mechanical element he can eliminate as an etiological factor in the production of the injury to these placenta he describes in the plates as congestion, hemorrhages and even some of the thrombi. There may be marked damage done to the placenta at delivery from muscular contraction of the uterus alone, and more if delivery of the placenta is prolonged or Credé used in completing the third stage.

DR. LITZENBERG: Young, whom Dr. Adair quoted, and Dr. Adair's paper are two illustrations of two different kinds of minds approaching the subject. Young found so many cases of infarcts in the placenta that he came to the conclusion that it was the cause of the toxemia. I remember saying at a previous discussion of Young's paper in one of our departmental meetings that it seemed to me that one could come to the exact opposite conclusions from Young, using the same data. I think Dr. Adair has suc-

cessfully refuted Dr. Young's contention that infarcts are etiological; and that they are more likely to be an effect from some unknown cause. Dr. Adair spoke of cases of toxemia that had no infarction. I have seen women who had convulsions who had no infarcts in the placenta. However, they occur so frequently in the toxemia of pregnancy that they must have some relation, although it is not a constant relation. Just what the relation is, it is difficult to say. We clinicians are apt to get impressions without very careful analysis. I have the impression that in the cases of pregnancy with a true nephritis infarction is very constant, but I think that it is a wise thing for us to pause and not to be carried away too far even by a man of Young's standing.

One other thing that Dr. Adair concludes that in the light of our present knowledge is quite logical, but which may at some future time be found to be not true. He says some of these cases are not toxemic—one woman was "not definitely toxic, yet not just right." Sometime when we know more we may have a different idea. There may be women who are toxic who do not show the toxemic symptoms as we think of them now. Some of these women may be mildly toxic that have these infarcts.

DR. HAMMOND (St. Paul): When I was in the maternity hospital in Montreal we used to keep pretty close track of the placenta and were particularly interested in infarcts. I think at that time we came to the conclusion that infarcts were almost always seen in cases where nephritis or high blood pressure were present or where there were definite signs of toxemia and we always looked upon the infarct as the result of kidney changes or toxemias. At that time we did not consider them as the cause of the toxemia.

I sent a rather interesting specimen over to the University today. The woman had gone overtime three or four weeks, according to her dates. The child was always more or less inactive. The fetal heart was rather indistinct, but definitely heard up to the time labor began. The woman went into labor; she had had some albumen but no signs of toxemia. At the time she went into labor the fetal heart was heard, but rather indistinct. There was a short normal first stage. At the beginning of the second stage the fetal heart was still more indistinct. In the course of two hours she was delivered. The child was dead. It was a very much under-nourished child, weighing six pounds. It was 44 cm. long, showing that it was overdue. The cause of the death of the child was a large infarct, at the insertion of the cord, which had gone on to cystic change. It shut off about half the circulation. There was no doubt about the cause of the death of the child in that case.

DR. LITZENBERG: I would like to ask Dr. Adair if he found any considerable number of fulminant cases that have no infarcts and also if there were any considerable number of cases of nephritis without infarcts.

DR. ADAIR (in closing): In answer to Dr. Condit's question, I would say that there are, of course, many changes seen in the placenta which cannot possibly occur in the short period of time elapsing between delivery of the child and delivery of the placenta. That a certain amount of congestion might result during the third stage is, I suppose, possible. That we could have congestion of the villi I

imagine is possible and yet I think a good deal of the congestion is on the fetal side, and after the child is delivered it would be rather difficult to explain why it should occur on the fetal side. It might be difficult to explain why this occurred only in localized areas. I really do not believe the retention of the placenta during the third stage to be much of a factor in causing these changes in the placenta.

With reference to Dr. Litzenberg's remarks, I showed some specimens from cases that gave no clinical signs of toxemia. This really is only indirect evidence that infarcts do not cause toxemia. The more conclusive evidence would be a rather marked toxemia without the presence of infarcts in the placenta. If we could demonstrate that, it would be almost conclusive evidence and I believe my specimens do show this. In many placenta you find old white infarcts.

In the fulminant cases of toxemia, infarcts are very common, especially these areas of recent degeneration and hemorrhage.

I think we find white infarcts especially in the more chronic cases, which would lend support to the idea that the white infarcts result from degenerative changes if the placenta remains long enough in the uterus.

In regard to nephritis, the two cases that I showed who had a high blood pressure evidently had previous hypertension with exacerbation during pregnancy. Whether or not there was any other cause is hard to tell. They both had various changes, both old and recent.

I have not seen a case such as that mentioned by Dr. Hammond, where an infarct obstructed the umbilical circulation. Extreme degeneration of the placenta is responsible for the death of the fetus. When a child outgrows the placenta, of course, it dies. This may account for some fetal deaths late in pregnancy. The child's growth continues as long as the normal placental tissue is able to meet its demands. If then the demands are not met, the child may die in utero.

JOHN E. HYNES,
Secretary.

TRANSACTIONS OF THE MINNEAPOLIS SURGICAL SOCIETY

STATED MEETING HELD NOVEMBER 8, 1923, THE PRESIDENT,
J. M. HAYES, IN THE CHAIR

Immediately before the regular meeting, the society presented Dr. A. W. Abbott with a small token of the respect of the profession which he has maintained through his fifty-five years of medical practice.

Dr. Farr made a concise presentation speech, as follows: Mr. Chairman, Members of the Minneapolis Surgical Society and guests:

Were it not for the realization of my almost total lack of ability to meet the requirements which have been imposed upon me by this society, the duty which is mine to perform would be one of the greatest pleasures of my life. I trust that any inadequacy on my part will melt into obscurity in your minds, which I know full well are surcharged with the consciousness that in honoring our es-

teemed confrère, Dr. Amos W. Abbott, we are honoring ourselves a hundred-fold.

Dear Doctor Abbott, we want you to know that we appreciate the fact that for fifty-five years you have been a potent factor in the growth and development of surgery; that you have been a leader in fostering medical progress; that your high medical and social standing have added greatly to the esteem in which our profession is held; that the enviable pinnacle upon which you stand today, after all these years on the firing line—years in which you were often tried but never found wanting—is constructed upon the qualities of honesty, integrity, perseverance and diligence, combined with an inherent modesty, love for your fellow men and the practical application of the Golden Rule. As an example to younger men your influence is undoubtedly the most marked of any with which I am familiar. Time will not permit the recounting of even a small portion of your attainments and yet from my own personal experience some indication of your qualities may be gained.

We all know something of your Civil War record. I have seen you meet adversity, which comes to all of us at times, with stoicism and without complaint. I have called you in council upon cases which I thought difficult only to learn that I needed a little more schooling. Upon each occasion I was instructed in such a manner that my respect and esteem for you increased—while the attitude of my patient towards me grew more respectful in a like manner. I have seen you during recent years remove a tumor, take it into your own laboratory, make frozen sections from it, dispute with a prominent pathologist regarding the diagnosis and win the debate. I well remember when, some years ago, I was seriously injured and taken to the City Hospital that you were the first of my medical friends to call upon me. I have borrowed money so often from you at medical conventions that during recent years your frequent voluntary offers of financial assistance have been the means of saving me great embarrassment.

And now, gentlemen, if close association, good fellowship and friendly contact are the cornerstones of steady and satisfactory advance, I feel that I bespeak the hearty conviction of each of us, that our association, whether close or remote, with Dr. Amos W. Abbott has been and always will be an elevating influence.

It is my extreme pleasure, therefore, to render you, Dr. Abbott, on behalf of the Minneapolis Surgical Society, while you are still with us in the full vigor of your health and mental faculties, this slight token of our appreciation.

Dr. Fred Olson presented a case of carcinoma of prostate.

The object of this report is primarily to bring before the society the frequency of early metastases along the tract of the thoracic duct in any genito-urinary malignancy; secondly, the apparent absence of local recurrence in the prostatic area. In this specific case, it is now more than three years after operation and there is comparatively complete control of certain secondary growths by radiation along the thoracic duct and its tributaries.

The patient, a male, aged 64, married, chiefly complained of difficulty and urgency in urination. He had had no

previous illness of importance. His general condition has been very good. He has noted increasing difficulty, frequency and urgency in urination during the last six months. No previous treatment. No gross changes noted in the urine.

Examination: Man of 5 feet 4 inches, apparently robust. Head and neck were negative. Heart shows some enlargement with a soft systolic murmur and accentuation of the second aortic sound. Systolic pressure, 180, diastolic 90 mm. Rectal examination shows a bilateral enlargement of prostate of about 2 on a scale of 1 to 4. Consistently uniform firmness throughout. There were 15 ounces of residual urine. The cystoscope revealed the usual picture of a large bilateral enlargement with trabeculated bladder, free from stone or infection. The urine, blood chemistry and phthalein tests demonstrated a moderate kidney insufficiency.

Preparation of patient by gradual decompression for ten days was followed by supra-pubic operation. The enucleation was easy and the wound dry in fourteen days, with an otherwise uneventful convalescence.

Microscopic section of the gland at time of operation was negative for malignancy.

A small area of adeno-carcinoma was demonstrated in the specimen at a subsequent examination seven months later, when an enlarged gland in the left cervical region was noted. The appearance of this gland gave the first indication of the malignant nature of the prostate. No urinary symptoms appeared nor is there any complaint on that score, today, three years after operation.

Cystoscopically the operative area and bladder are negative today.

The usual x-ray and radium therapy was employed locally and along the spine and cervical region.

The patient presents no demonstrable bony metastases. From time to time intense radiation with radium is given along sacral, lumbar and cervical spine with immediate relief of the recurring backache which is the patient's only complaint.

General condition of the patient is very good at the present time.

DR. F. S. BISSELL (speaking by invitation) discussing treatment of Dr. Olson's case:

There is very little I can add except from the standpoint of technic. At the time I first saw the patient, both history and symptoms pointed strongly to metastases involving the retro-peritoneal lymph nodes and extending along the thoracic duct to the left supra-clavicular region. As usual in these cases the pain was constant and quite severe. An interesting and somewhat unusual feature of the case was the immediate relief which he experienced after each radium treatment.

Relative to technic it may be well to emphasize the factor of distance, which is of the greatest importance in cases like this one. By using a block of wood, one inch thick, between radium tubes and skin it is possible to greatly increase the percentage-depth-dose. This point needs to be stressed because there seems to be a rather general impression among medical men that radium technic is not important but that it is only necessary to apply

radium to the skin over the involved areas for a specified length of time.

The patient has not received any treatment for approximately one year and has been wholly free from symptoms or signs of further recurrence.

Dr. T. H. Sweetser presented an interesting case of renal calculus.

This young man is twenty-three years old and single. During the last four years he has had repeated attacks of severe pain in the left flank and lumbar region radiating to the left shoulder and sometimes to the left hip and scro-um. Hematuria, pyuria, nocturia and polyuria have been noted during the attacks. He was first admitted to the Minneapolis General Hospital on July 13, 1923, during a similar attack. Physical examination showed generalized abdominal tenderness with rigidity of the left rectus muscle, tenderness over both kidneys, pain on percussion of both lumbar regions, and rigidity of lumbar muscles. The urine showed pus; leucocyte count was 10,000. Roentgenogram of entire area of urinary tract shows an oval dense shadow about 2 cm. in diameter medial to the lower pole of the left kidney and an irregular group of small shadows in the shadow of the lower pole of the same kidney. As his attack ceased promptly and he had no more discomfort he refused further investigation and treatment and left the hospital on July 20th feeling very well.

On September 5th the ambulance brought him in during a similar, but very severe, sudden attack. The physical signs indicated trouble on the left side only. At that time there was some specific urethritis, and as the patient was promptly relieved of his pain, cystoscopy was not deemed advisable and he was sent to the outpatient department on September 8th for treatment of the urethritis.

His last admission to the hospital was on November 10th during a similar but less severe attack. Cystoscopy on November 21st with the usual local anesthesia of the mucous membranes showed a little puffiness at the left ureteral orifice. An opaque catheter was passed easily up the left ureter, but the other catheter was arrested about 2 cm. from the right ureteral orifice, and attempts to go further with different catheters failed. We felt that this was due to muscle spasm there. Roentgenogram, as you see, showed the tip of the left ureteral catheter touching the lower aspect of the large oval shadow previously seen; when pyelogram was attempted only a very little fluid entered into the renal pelvis. The obstruction was, however, not complete, as we obtained some urine through the catheter; the sample contained a few erythrocytes and many leucocytes. Culture gave no growth.

Another cystoscopy was undertaken on November 26th under caudal anesthesia. Slight edema was noted at both ureteral orifices. Catheters passed easily up both ureters. Specimens showed occasional leucocytes and some erythrocytes. Cultures were negative. Phenolphthalein, given intravenously, appeared through the right side in three minutes and through the left in five minutes. In order to be sure of filling the renal pelvis this time, the patient was tilted back with the head down at an angle of about 45 degrees; the sodium iodide solution was run in by gravity as usual. These interesting pictures were secured.

You see that the left renal pelvis is greatly dilated, the calyces are flattened, and the stone shadows are all obliterated by the iodide solution. The right renal pelvis is slightly dilated but the calyces are not flattened.

Sixteen hours later this other roentgenogram of the entire urinary tract was made. There is no trace of the iodide solution on the right side, but on the left side the stone shadows, especially the small ones in the lower pole, stand out much more prominently than previously because a coating of sodium iodide stuck to them. It has been pointed out by different writers that sometimes a urinary calculus of about the density of the soft tissues may be discovered by just such a procedure, after it has escaped detection in a plain roentgenogram and in a pyelo-ureterogram.

Pyelotomy was performed on this patient on December 3rd by Dr. Oscar Owre. The largest stone was removed intact and smaller soft stones were removed from the lower calyx piecemeal. You may see that his wound is practically healed and that he walks quite well. He left the hospital on January 4th.

In addition to the history of this interesting condition, I wish to emphasize several practical points. First, occasionally an obstruction may be met about 1 cm. from the ureteral orifice, the obstruction being due solely to muscle spasm; second, cystoscopic examination in some patients is greatly facilitated by the use of caudal anesthesia; third, a procedure is described which helped us to secure a pyelogram in spite of a stone obstructing the outlet of the renal pelvis; fourth, the localization of shadows within the urinary passages may be proved by obliterating them with a pyelo-ureterogram, and by the fact that they may be brought into greater prominence in a picture taken a few hours after the pyelogram has been made.

Dr. E. S. Judd, Rochester, presented the paper of the evening. Subject: "Surgery of the Gallbladder." See page 161.

PROGRESS

Abstracts to be submitted to Section Supervisors.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH

THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

THE REACTION OF THE PARATONSILLAR TISSUES IN TONSILLECTOMY. A STUDY OF THE ETIOLOGY OF POST-TONSILLECTOMY PULMONARY ABSCESS: George Fetterolf, Herbert Fox. (Amer. Jour. of Med. Sc., Dec., 1923.) The authors have shown from a pathological study that the paratonsillar tissue after tonsillectomy is studded with thrombi which may be either sterile or septic, and that as a result of trauma, sepsis and muscular action these thrombi may be dislodged into the

superior caval circulation. Pulmonary emboli are therefore relatively frequent, and may escape notice on account of their small size, sterile character and prompt resolution. As a prophylactic measure they suggest that the routine use of deep transfixion sutures in tying the blood vessels be abolished, and that surface ties be used instead on account of the possibility of infection being carried more easily into the circulation through the transfixion of the thrombi in the vessels.

Inspiratory post-tonsillectomy lung complications are probably not as common as has been thought, and lymphatic transmission of the infection to the lungs they consider extremely rare.

A surgical procedure aiming at a diminution in the morbidity following tonsillectomy consists in their opinion in an intracapsular tonsillectomy as suggested by Makuen. They believe that in its perfected form it will tend materially to reduce the incidence of pulmonary complications following the operation, since the removal of the capsule with the tonsil as done at present removes an excellent bulwark to the infected nidus.

F. J. HIRSCHBOECK.

THE CHRONIC APPENDIX-C: Hamilton Whitehead. (The Practitioner, August, 1922. Page 155.) The author's classification of the diagnosis of chronic appendicitis is a convenient solution of diagnostic difficulties. The symptoms and pathological findings in so-called chronic appendicitis are discussed at length. The writer's conclusions are:

1. The enormous number of patients whose abdominal ailments are now diagnosed as chronic appendicitis chiefly consist of symptoms of widely varying causation and for which symptoms, the appendix is not responsible.

2. The symptoms attributed to the chronic appendix are not explained by the pathological findings and are not cured by removal of the appendix.

3. The operation for removal of the chronic appendix not only fails to cure, but frequently makes the patient worse.

4. Attribution to the appendix of abdominal discomfort of obscure origin hinders investigation into the causes of abdominal pain.

5. In the surgeon, the chronic appendix theory produces laxity in diagnosis and in operating, and incisions are made so small that thorough examination of the abdominal contents is made a mechanical impossibility.

6. In the layman, the operation for the removal of the chronic appendix, because of its failure to cure and because of its after effects, is producing doubt about the necessity for operation in acute appendicitis and mistrust in the bonafides of the surgeon.

7. The chronic appendix theory judged by the test of the ability of the operation for removal of the appendix to rid the patient of his symptoms, is found wanting.

8. In the interest of surgeons and patients the diagnosis of chronic inflammation of the appendix as a condition requiring operation should be abandoned.

PAUL H. ROWE.

SURGERY

SUPERVISORS:

DONALD K. BACON,
LOWRY BLDG., ST. PAUL

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MAYO CLINIC, ROCHESTER

RESULTS IN GALL-BLADDER SURGERY: F. N. G.

Starr (Surg., Gyn. and Ob., September 1923). Gall-bladder disease may mean many degrees of inflammation as well as stone formation.

As a life saving measure, drainage or a more radical surgical procedure is considered in the following conditions:

1. Acute inflammation without jaundice.
2. Acute inflammation with cystic duct obstruction.
3. Acute inflammation with rupture of the gall-bladder. (Rare—occurred only three times in 450 cases.)
4. Acute inflammation with so much associated thickening of the duct that obstruction occurs with jaundice.
5. Acute inflammation with common duct obstruction from stone causing jaundice.

The procedure to be followed in these conditions is, first to choose a suitable time, then follow a plan destined to relieve the acute condition, rather than make a brilliant operation. Further restorative measures can be thought of later.

From the economic aspect, distressing symptoms of right costal margin pain with radiation, gas distress, qualitative food distress, constipation, and diarrhea with upper abdominal distress and mucus in the stools should be relieved by operation.

Thirty-two and four-tenths per cent of the author's patients suffered with constipation, and cholecystectomy relieved 72 per cent of them. In cases of diarrhea (29 per cent) the staphylococcus aureus was found in the gall-bladder. Sixty-five and one-half per cent of these have been relieved of the so-called mucous colitis by cholecystectomy.

We should aim to prevent acute conditions, chronic pancreatitis, hemorrhagic pancreatitis, and carcinoma resulting from continued irritation in these cases.

A method of procedure with a medical régime is advisable in some cases, and in others careful pre-operative observation and preparation, proper choice of anesthetic, proper operative technique and postoperative régime is given.

The author closes by stating that if gall-bladder surgery is instituted soon after the first symptoms develop, the mortality is negligible, the disaster of complications is avoided, and the efficiency of the individual as an economic asset is improved, as about 66 per cent of these patients are cured and 34 per cent are relieved of most of their symptoms.

W. P. HERBST.

THE RADICAL OPERATION FOR TERATOMA TESTIS: Frank Hinman, Thomas E. Gibson, Adolph A. Kutzmann (Surg., Gyn. and Ob., Vol. 37, October 1923). This paper is a study of eighty-three cases of testicular tumor in which radical operations were performed, including removal of the lymphatic drainage tissues.

The present radical operation has developed as a result of the work on the lymphatic system of the testicle by Most in 1899. He demonstrated that the primary lymph nodes of the testicle were retroperitoneal along the aorta and vena cava in the lumbar region, at the site of embryological origin.

Pathologically there are two current views. Chevasu maintains that there are two groups—the mixed tumors of the testicle, and a large group of unicellular tumors of malignant nature arising from the epithelium of the seminiferous tubules, called “seminoma.” Ewing states that all testicular tumors are teratomatous in origin, and the authors incline to this view.

The diagnosis of malignancy of a testicular tumor is so difficult and uncertain that any testicular enlargement demands surgical inspection and microscopic study. The growth may be masked by hydrocele. Four cases had a radical operation performed for gummata and massive tuberculosis because a careful examination was not made before proceeding with the radical operation. All ages are affected but most commonly between twenty and fifty. The duration or nature of the tumor does not help in indicating the presence or absence of metastases. There is a relatively greater occurrence of malignancy in cryptorchids.

The prognosis of patients with tumors of the testicle is very poor. The seminoma growth is less malignant than the teratoma. Only about 15 per cent of patients on whom orchidectomy has been practiced have been cured. This fact has led some to advocate radiation as the treatment of testicular tumors, as in some cases it has accomplished phenomenal results.

The operation which the author advises has raised the number of cures by surgery from 15 to about 30 per cent, with an operative mortality of 9 plus per cent.

In treating these cases the operable cases are all treated radically. The inoperable cases, which are made up of the groups in which malignant masses retroperitoneally are fixed and cannot be removed, and those in which masses are palpable through the abdominal wall when examined, are treated by radiation. When these masses are discovered at the time of exploration, radium is inserted at that site, or later through tubes left in as for drainage.

The technical steps of the radical operation are described in detail and illustrated. Briefly they are as follows: positioning of patient with side turned a little to opposite side; incision and clamping of the cord through an inguinal incision; delivery of testicle followed by cautery castration clamp; laboratory examination; extension of incision parallel to twelfth rib. The peritoneum is then separated by incision in the iliac fossa to expose the large abdominal vessels, followed by division and ligation of spermatic vessels at their origin, resection of gland-bearing area from above downward, exposure of retroperitoneal and iliac area to roentgen radiation on operating table, placing of rubber

tubes for drainage, and radium therapy at the back or upper end of the wound.

The author (Hinman) ligated the inferior mesenteric artery in one case in order to make a clean removal of the glands. This patient died of acute cardiac dilatation a few hours after operation, so that the efficiency of the collateral circulation of the human could not be determined. In cats and dogs this artery can be ligated with no bad effect.

The authors have many excellent detail-giving tables on the cases and an extensive bibliography.

W. P. HERBST.

POSTOPERATIVE INFECTIVE PAROTIDITIS: William H. Fisher (Annals of Surgery, Vol. 77, November 1923). Parotitis, following operations on distant parts of the body, is classified according to the severity of the inflammatory process in the parotid gland as follows:

1. Acute parotitis.
2. Acute suppurative parotitis.
 - (a) Circumscribed.
 - (b) Diffuse parotitis.
3. Gangrenous parotitis.

Acute parotitis or simple inflammation occurs usually three to five days after operation. It is characterized by a swelling of the gland and the usual symptoms of any infectious disease. In three or four days this condition usually subsides. Iodine and ice applications are used to most advantage.

Acute suppurative parotitis is characterized by pus formation with an accompanying increase in severity of systemic and local symptoms. Pus can usually be expressed from Stensen's duct when no obstruction exists. Occlusion of the duct by a stone should be ruled out by passage of a probe. A single localized abscess usually recovers by maintaining drainage through Stensen's duct. In cases in which there is a diffuse process the general symptoms are much exaggerated and there is immense swelling of the face, dysphagia, meningeal disturbance, chilling, and leukocytosis.

If there is not free and satisfactory drainage of pus from Stensen's duct the gland should be exposed by a V incision. This incision is made from the zygoma anterior and close to the tragus, down along the sternocleidomastoid muscle. Then a 2½-inch curved incision is made from the mastoid to join the original incision.

These cases that do not do well may have pus burrow to the supraclavicular region, follow the sheath of the vessels to involve the mediastinum or form a retropharyngeal abscess. The mortality in these cases is about 30 per cent.

Gangrenous parotitis is rare, but invariably fatal when it does occur. In these cases all the symptoms are more severe and the pressure of the unyielding parotideo-masseteric fascia causes rapid gangrene. The surrounding structures become involved by the gangrene and death results from septicemia.

The author cites cases to illustrate the different types of parotitis with the proper treatment.

W. P. HERBST.

CHRONIC CHOLECYSTITIS WITHOUT STONE:

Frederic W. Bancroft. (Ann. of Surgery., Nov., 1923.) This is a study of thirty-eight consecutive cases of cholecystitis without stones in which the history, pathology, and late results have been analyzed.

Four methods of infection of the gall-bladder are mentioned as follows:

1. A descending bile-borne infection from the liver.
2. An ascending ductile infection from the duodenum.
3. A hematogenous infection.
4. A spreading infection to the wall of the gall-bladder through the lymphatics from an inflamed contiguous organ.

Twenty-four women and 14 men made up the series of cases. The age at the time of operation was 36 in both men and women, and the average duration of symptoms was $2\frac{1}{2}$ years.

The usual complaint was pain and soreness in the epigastrium or right upper quadrant with indigestion and gas persisting over a considerable period of time. Eleven women and 5 men had had previous operations for lower abdominal inflammatory conditions. Twelve of the patients operated on had definitely diseased appendices, which were removed at operation. This makes 28, or 73.7 per cent, of the cases with associated infection elsewhere.

Upon physical examination the following was found:

Adiposity: Usually moderate amount.

General appearance: Usually not sick.

Tenderness at Murphy's point on deep pressure: Present in 35, absent in 3.

Rigidity: Moderate degree, 9; marked, 4; absent, 25.

Lyon test: Positive in the nine cases in which it was used.

The ante-operative diagnosis in these cases were: Cholelithiasis, 13; cholecystitis, 15; adhesions about duodenum, 4; ulcer of stomach, 2; not mentioned, 2.

Cholecystectomy was done in 31 cases and cholecystostomy in 6 cases. The appendix was removed in 20 cases and found diseased in 12.

The gall-bladders removed were carefully studied microscopically and two pathological types were observed which may or may not have been various stages of the same disease. In one type the mucosa and villi were relatively normal but the submucosa was thickened and there was round cell infiltration in the muscularis and submucosa. In the other type, the so-called strawberry gall-bladder, there were coarsely shaped villi and ulceration of the tips, with scar tissue formation, round cell infiltration, and lipoid deposits in the villi. Boyd found that normal gall-bladders contained 1.70 per cent cholesterol, and that strawberry gall-bladders contained 50 per cent cholesterol.

According to Chauffard small biliary calculi originate inside the villi as minute clusters of cells surrounded by cholesterol. These are shed, then increase in size and ultimately become faceted.

Cholecystectomy resulted in 88.5 per cent cures and cholecystostomy in 50 per cent cures.

The article contains eleven photomicrographs illustrating the normal and diseased gall-bladder conditions.

W. P. HERBST.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,
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ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

AN EFFICIENT TREATMENT FOR RESISTANT CASES OF PYELITIS: J. Spencer Davis (Arch. of Ped., October 1923). All authorities are agreed that the disease is much more frequent among females and that the colon bacillus is the most frequent organism found although a mixed infection may be present and occasionally other organisms are the only ones in evidence. In some cases of recurrent pyelitis, specimens of urine obtained by catheter in absence of clinical signs have yielded cultures of colon bacilli. It is apparently in this type of case that an intercurrent affection such as coryza will precipitate an attack of pyelitis. Constipation seems also to play a role at times and the child will escape an attack as long as the bowels are kept active.

Treatment: Some writers prefer alkaline treatment while others alternate urotropin and acid sodium phosphate with alkalis.

Vaccines: For the relief of symptoms, vaccines sometimes play a role but their curative properties are doubtful. For the past ten years injections of whole blood unaltered by anticoagulants was used in the treatment of these cases which did not yield to medication. An attempt was made to determine the smallest quantity of blood which would prove effective. This was found to be 20 c.c. In the severer types of recurrent infections, this was found to be inadequate and larger quantities up to 100 c.c. had to be given. After the injection no medication was given.

Reaction: In some cases it was noted that the patient would have a chill a few hours after the injection followed by profuse perspiration and a fall in temperature, frequently to normal. If the temperature did not reach normal in thirty-six hours, a second injection of blood was given.

Effect on Child's Blood: In a few hours after the injection there is a prompt rise in the leucocyte count, if it is not already high. In some cases, with marked improvement in twenty-four hours the rise in leucocyte count persisted, while in others it declined, especially when there was marked decrease in the number of bacteria in the urine.

Effect in the Urine: In cases showing improvement, the number of bacteria was decreased without necessarily any decrease in the number of pus cells. The pus cells were found in decreasing numbers for several days after the child was clinically well.

Relapse: Out of a group of fifty cases, thirty-five were selected which were followed for from three to five years. These were all severe cases, many of which had had several attacks. In only one was found a recurrence. This case, about two years after an attack which was treated as above, had a recurrence and developed a perinephritic abscess.

R. N. ANDREWS.

AN EFFICIENT TREATMENT FOR RESISTANT CASES OF PYELITIS: J. Spencer Davis. (*Arch. of Ped.*, Oct., 1923.) For the past ten years Spencer has used injection of whole blood unaltered by anticoagulants in the treatment of cases which did not yield to medication. Twenty cubic centimeters was customarily given although in the severe types of recurrent infection larger quantities up to 100 c.c. were given. The greatest number of injections has been five, but in many cases a single injection was all that was necessary. After the injection no medication was given. Occasional systemic reactions occur associated with a definite leucocytosis. Of thirty-five severe cases observed from three to five years, only one relapse occurred.

C. A. STEWART.

THE RELATION BETWEEN CHRONIC TONSILITIS AND ACUTE KIDNEY INFECTIONS: D. Leasesne Smith and C. Williams Bailey (*Arch. of Ped.*, August, 1923). Kidney infections are common complications of the acute infectious diseases, and the primary focus of infection is then a foregone conclusion. But when the primary symptoms are referable only to the kidneys, the case assumes an entirely different aspect. It is generally thought that acute nephritis and pyelonephritis are secondary infections. Also it is generally known that, as in acute rheumatic fever, the symptoms of the secondary infection may completely overshadow those of the primary or the primary infection may be producing no known symptoms. Both primary and secondary infections may or may not clear up spontaneously. In any event, if the primary focus is removed, the secondary trouble will usually disappear if the parts secondarily infected have not been permanently and organically disabled.

Now the tonsils are perhaps the most common avenues of infection; consequently, in a seemingly primary acute nephritis or pyelonephritis, it is logical, first, to suspect that the tonsils are responsible for the entrance of the infecting organisms. If then upon this suspicion the tonsils are found chronically infected and no other focus can be found, it is reasonable to conclude that the tonsils are the primary seat of the disease, the diagnosis being then chronic tonsillitis complicated by acute nephritis or pyelonephritis, as the case may be. In such cases why not immediately remove the tonsils right in the acute stage of the kidney disorder? If in time the acute symptoms subside and the patient recovers, all is well. But if time is allowed, and the kidneys become permanently damaged, the patient may be beyond any help. Many cases of acute appendicitis recover spontaneously, but is it ever advisable to take the chance and wait?

When only the colon bacillus is found to be the infecting organism in acute pyelonephritis, the findings usually indicate less kidney substance involvement and more pelvis inflammation. In these cases the tonsils probably cannot be incriminated as the chief offenders. The more exact method of diagnosis would be to make cultures of the tonsils, blood, and urine. If the organisms are the same in all three, or if tonsils and urine contain the same organisms, the connection is apparent. The removal of the tonsils at the acute stage was well borne by all the cases.

R. N. ANDREWS.

EXOPHTHALMIC GOITER IN CHILDHOOD WITH SOME UNUSUAL MANIFESTATIONS: Henry Heiman, New York (*Amer. Jour. of Dis. of Child.*, September, 1923). Sex distribution shows a definite preponderance of females. The ultimate cause of the disease must act primarily or secondarily through the involuntary nervous system. Heredity has played an important rôle in a large number of reported cases. In none was there any history of syphilis. The structure of the thyroid gland and its pathology have been clearly described by Marine. Uniform enlargement of the thyroid may be produced by a hyperplastic or a colloid gland. In the former, the epithelium is higher and the walls of the alveoli may be thrown up into plications. There is increased blood vessel supply and at times round-cell infiltration of the stroma. The colloid is diminished. In the colloid gland, there is a formation of large amounts of colloid material which stretch the alveolar spaces and produce a flattened epithelium. There is marked thickening of the walls of the blood vessels.

The cardinal symptoms of exophthalmic goiter are tachycardia, exophthalmos and enlarged thyroid gland. The most important diagnostic test is an increased basal metabolism. The exophthalmos is usually less marked in children than in adults, but its presence is generally definitely observed. Graefe's and Stellwag's signs were present in all our cases. The basal metabolism test has proved to be the most important guide in diagnosis as well as in the determination of the severity of the disease. The results in the three cases before treatment were: First case, plus 12 per cent; second case, plus 20 per cent; third case, plus 52 per cent. Clinically, the degree of severity of the symptoms and signs corresponded with the degree of elevation of the metabolic rate. Osler believed tremor to be one of the cardinal symptoms, but in childhood it has not been frequently observed. Alertness and irritability were present in all cases. The mentality of the children was above the average.

In the light of all recent evidence regarding treatment, it seems the most rational procedure to institute first a regimen of strict physical and psychical rest for six to ten weeks. If the patient shows no improvement, a short period of roentgen ray therapy should be tried. Thyroidectomy should be performed if there is no response to the roentgen ray. On account of the toxic action on the heart in the severe cases, it is safer not to wait too long before operation.

R. N. ANDREWS.

CHRONIC ULCERATIVE COLITIS IN CHILDHOOD: Henry F. Helmholz. (*Amer. Jour. of Dis. of Child.*, Nov., 1923.) A careful search of the literature has failed to reveal a single article dealing with chronic ulcerative colitis in childhood. Although different in their mode of onset, when fully developed these cases appear to be the same, the chronic recurring dysentery with watery, bloody passages, marked emaciation, persistence of the symptoms in spite of treatment, and the absence of any known etiologic factor. Chronic ulcerative colitis, as defined by Logan, is a chronic inflammation of the large bowel, of unknown etiology, and showing all grades of inflammation, from a reddened, congested, easily bleeding mucous membrane, to

superficial and deep ulceration, with constant or recurring dysentery, lasting from many months to several years.

So far as is known, there is no single definite etiologic factor in chronic ulcerative colitis. The condition may be the result of a variety of infections, pyogenic, dysenteric, amebic or tuberculous; but wherever a specific cause can be demonstrated, the condition is usually not considered chronic ulcerative colitis.

The ulceration begins in the lower portion of the bowel, and in the course of the illness the entire colon is involved. Only rarely is the ileum involved. On proctoscopic examination, the ulcers are usually most marked in the rectum and lower sigmoid, and in the early cases become less numerous in the sigmoid. The colon is usually thickened, the surface appearing red and glazed, with numerous small ulcers. In the severe cases, only small islands of mucosa are left, the entire surface being ulcerated, and presenting a granular appearance. The roentgenogram is characterized by marked narrowing and absence of haustrations in the full extent of the involved colon. Large hemorrhages occur only occasionally in the adult, but seem to be more frequent in the child. If there is no complication, the patients are usually free from fever.

Under medical treatment, the outlook is bad. Logan gives a mortality of 7.5 per cent in his cases. All of the four patients in the series did poorly under medical treatment alone, and only two improved after surgical intervention. In two cases a colostomy, in the third an appendicostomy, and in the fourth an ileostomy (Brown operation) was performed, by means of which the lower bowel could be constantly irrigated with saline solution. Recently Logan has reported several cases in which the patients improved markedly under massive doses of iodine by mouth. If the patient does not improve in the course of six weeks or two months, under medical treatment, it is advisable to operate. The operation of choice is unquestionably the one devised by Brown, consisting of an ileostomy with the establishment of a complete fecal fistula, through the lower loop of which the colon can be irrigated.

R. N. ANDREWS.

GYNECOLOGY AND OBSTETRICS

SUPERVISORS:

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THE TREATMENT OF GONORRHEAL ENDOCERVICITIS BY HEAT: Budd C. Corbus and Vincent J. O'Connor. (*Surg., Gyn. and Ob.*, Vol. 38, January, 1924.)

Many methods have been tried for the cure of gonorrheal endocervicitis. Failure has been due to a lack of definite knowledge of the pathology and inaccessibility of the affected parts to topical applications.

Curtis has shown by histological and cultural examina-

tions: the infrequency of chronic endometritis; the rarity of gonococci in fallopian tubes removed from patients free from leucocytosis and fever for a period of ten days or two weeks; sections of cervixes very frequently show gonococci.

Persistent tubal gonorrhea results from the recurrence of an infection from without or more commonly from repeated invasions from a chronic lower genital tract infection.

Gonococci localize in the cervical glands and are the predisposing cause of purulent endocervicitis and leucorrhea.

Utilizing the well-known fact that gonococci are instantly destroyed at a temperature of 113° F. (45° C), the authors have devised an electric thermophore for introduction into the cervical canal. By this device a constant temperature of 116°-117° F. is maintained for 30-40 minutes without pain or discomfort to the patient. Treatments are repeated at seven or ten day intervals. The treatment causes a rapid healing of cervical erosions and the purulent cervical discharge quickly assumes a watery character. Treatments are continued until the gonococcus is absent from five successive smears.

After an elapse of two months, 5 per cent silver nitrate is applied endocervically. With two negative smears the patient is pronounced cured.

In twenty-two cases the gonococcus disappeared permanently from the cervical discharge; after one treatment, five cases; two treatments, seven cases; three treatments, four cases; four treatments, two cases; seven treatments, four cases.

Contraindications to treatment are pregnancy, acute pelvic cellulitis and salpingitis.

L. W. BARRY.

ROENTGENOLOGY

SUPERVISORS:

LEO G. RIGLER,

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PULMONARY ABSCESS ROENTGENOLOGICALLY CONSIDERED: W. H. Stewart (*Jour. of Radiology*, Page 277, August, 1923). The causes of pulmonary abscess in the order of their frequency are tonsillectomy, pneumonia, lobar or lobular, other operations, inhalation of foul water while bathing, sacculated empyema breaking through the visceral pleura. A primary abscess may occur with pneumonia as a secondary manifestation.

Most abscesses may be diagnosed clinically. The x-ray is chiefly valuable for localizing the abscess, determining its extent and the presence of associated lesions. The early appearance is that of an oval-shaped localized pneumonitis. With the development of cavitation a lighter area appears within the zone of infiltration. The cavity may be filled with fluid giving a homogeneous shadow; or it may be partly filled showing a fluid level.

Roentgenologically, the most common mistakes are the diagnosis of one abscess when there are a number of smaller ones; and diagnosing abscess when sacculated empyema is actually present. The latter can best be distinguished by the absence of foul sputum. Air bubbles appearing in an encapsulated empyema may be due to a bronchial fistula or to needling. Tuberculous cavities can be distinguished by the lack of infiltration about them, their position, the laboratory findings and the presence of other areas of tuberculous infiltration. Sarcomata are very difficult to diagnose.

The author advises drainage by means of repeated bronchoscopy as the best form of treatment. If necessary injections of silver salts or bismuth subcarbonate suspended in sweet oil should be given. Frequent roentgen studies, with the patient in the prone lateral position and the tube posterior, should be made to check the results of treatment. The cases with much infiltration and little softening do not respond well to bronchoscopic treatment and surgical intervention is advised. The abscess must be accurately localized for the surgeon and is best done with the hand fluoroscope on the operating table, to avoid the errors which result from slight changes in position or in phase of respiration.

LEO G. RIGLER.

LOCAL RESISTANCE TO SPONTANEOUS MOUTH CANCER INDUCED BY X-RAYS: J. B. Murphy, J. Maisin, E. Sturm (Jour. Exper. Med., Vol. 38, p 645, November 1923). In a previous paper, Murphy and his co-workers have shown that an erythema dose of x-rays given over an area of skin renders this area highly resistant to inoculation with transplantable cancer. To make this work more convincing, further experiments were done using auto-grafts from spontaneous mouse tumors. The tumor was removed from the mouse and an area in the flank was exposed to an erythema dose of x-rays. Portions of the removed tumor were then inoculated in both flanks of the same mouse. On the radiated side there were 16 per cent takes, while on the non-radiated side 71 per cent of the grafts grew. All the growths which did occur on the radiated side were smaller and slower growing than those on the non-radiated side. Two further sets of experiments were done using the same experimental and control methods. These showed that radiation of the tumor cells themselves, either in vitro or in situ after transplantation, did not hinder their growth or prevent transplantation, if immediately transplanted to a different non-radiated area. The work was done on enough cases and with sufficient controls to warrant careful consideration of the results. These indicate that the retardation in growth and the destruction of mouse tumors, which occur after an erythema

dose of x-rays, is not due to the specific effect upon the tumor cells, which is generally believed, but rather to an effect upon the normal tissues in which the tumor is implanted. The authors do not believe the results of x-ray therapy on cancer can be due to greater susceptibility of tumor cells, but rather to the change induced in the tumor bearing tissue.

LEO G. RIGLER.

PERICARDITIS WITH EFFUSION: Hodges (Jour. Rad., October 1923). Acute pericardial effusions are most often due to acute articular rheumatism, pneumonia, or other infections. Chronic effusions are uncommon and are most often due to tuberculosis. The fluid may vary in amount and may be serous, sero-fibrinous, sero-purulent, or hemorrhagic. Pain is the chief symptom and the pericardial friction rub is the chief diagnostic point in small effusions. The author considers the only physical signs of value in the larger effusions to be, the friction rub, extension of the cardiac dullness upward on the left, substernal dullness changing with change in the position of the patient, broadening of the cardiac area, signs of compressed lung at the angle of the left scapula, and pushing down of the left lobe of the liver. Roentgen examination is useful, when there is more than 200 c.c. of fluid, to determine the presence of fluid, its extent, location for paracentesis, and to distinguish pericardial effusions from pleural effusions and from consolidations of the lung. There is a difference of opinion amongst clinicians and roentgenologists as to the value of the roentgen ray, especially in distinguishing pericardial effusions from dilated hearts. The author studied sixteen cases of pericardial effusion, in five of which the diagnosis was not made by the roentgenograms. In four of these there was less than 200 c.c. of fluid. The findings were as follows: widening of the mediastinal shadow; a bulging of this shadow upward and to the left; widening of the heart shadow; obliteration of the curves of the borders of the heart; extension of the mediastinal borders as more or less straight lines up to the clavicles; change in the contour of the cardiac shadow with change in the position of the patient; weakened cardiac impulse. In the presence of adhesions the mediastinal shadow may show little change. In the presence of large pleural effusions the diagnosis may be difficult. To differentiate it from dilated heart, mediastinal effusions and tumors, the most valuable sign is the change in the contour of the heart with change in position of the patient. The diagnosis is of importance as paracentesis may be a life saving measure. Negative diagnoses in the presence of fluid are more excusable than positive diagnoses in the absence of fluid.

LEO G. RIGLER.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

ANNUAL REPORT OF THE SURGEON GENERAL OF THE PUBLIC HEALTH SERVICE OF THE UNITED STATES FOR THE FISCAL YEAR 1923. 316 pages. U. S. Government Printing Office, Washington, D. C., 1923. Cloth, \$0.75.

THE ROCKEFELLER FOUNDATION. ANNUAL REPORT FOR 1922. 419 pages. Illustrated. New York: The Rockefeller Foundation Press, 61 Broadway.

INTERNATIONAL CLINICS. Edited by Henry W. Cattell, A.M., M.D., Philadelphia, in collaboration with others. Volume IV, 33rd series, 1923. 308 pages. Illus. Philadelphia and London: J. B. Lippincott Co., 1923.

SEWAGE TREATMENT IN THE UNITED STATES. Report on the Study of Fifteen Representative Sewage Treatment Plants. H. H. Wagenhals, E. J. Theriault and H. B. Hommon. Prepared by direction of the Surgeon General. 260 pages. Washington, D. C.: Government Printing Office, 1923. Paper, \$0.50.

LECTURES ON ENDOCRINOLOGY. Walter Timme, M.D., Attending Neurologist Neurological Institute, N. Y.; Professor of Endocrinology, Broad Street Hospital; Professor of Nervous and Mental Diseases, Polyclinic Medical School and Hospital. 123 pages. 27 illus. New York: Paul B. Hoeber, 1923. Cloth, \$1.50.

HERNIA. Leigh F. Watson, M.D., Associate in Surgery, Rush Medical College, Chicago. 660 pages. 232 illus. St. Louis: C. V. Mosby Co., 1924. Cloth, \$11.00.

PRACTICAL CHEMICAL ANALYSIS OF BLOOD. Victor C. Myers, M.A., Ph.D., Professor and Director of the Department of Biochemistry, N. Y. Post-graduate Medical School and Hospital. 2nd edition. 232 pages. Illus. St. Louis: C. V. Mosby Co., 1924. Cloth, \$5.00.

MANAGEMENT OF THE SICK INFANT. Langley Porter, B.S., M.D., M.R.C.S. (Eng.), L. R. C. P. (London),

and William E. Carter, M.D., Assistant in Pediatrics and Chief of Out-patient Department, University of California Medical School, Attending Physician, San Francisco Hospital. 2nd edition. 659 pages. Illus. St. Louis: C. V. Mosby Co., 1924. Cloth, \$8.50.

GENERAL MEDICINE. Vol. I. The Practical Medicine Series. Edited by George H. Weaver, M.D., Lawrason Brown, M.D., Robert B. Preble, A.M., M.D., Bertram W. Sippy, M.D., Ralph C. Brown, B.S., M.D. Series 1923. Chicago: The Year Book Publishers.

The 1923 Volume of General Medicine in the Chicago Practical Medicine Series conforms to its past high standards. Perhaps the most valuable single asset in this review is the accuracy and brevity with which the various subjects are handled. There are some outstanding features that deserve special notice. The article on diseases of the blood is very interesting. The pathogenesis of pernicious anemia receives considerable attention, but progress in this direction does not seem to have been made. The suggestion that reactions following blood transfusions may be allergic is arresting and within the last year has received more and more attention. Perhaps one of the most readable reviews in the volume is the one showing clinical charts which are recommended by the Association for the prevention and relief of heart disease. These are worth careful study and their use would probably do much to eliminate the occurrence of cardiac lesions. There is a review of the treatment of asthma which does not advance our knowledge of this subject much further than it has already been done by Walker and others.

One would like to pick out further examples of concise narration covering interesting facts recorded in the past year; these, however, merit a direct reading of the volume. The few instances recorded above have been given with the hope that they would awaken interest in the book itself.

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ORIGINAL ARTICLES

SYPHILITIC AORTITIS*

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The predilection of syphilis for the arterial system, especially the thoracic aorta, is a well established fact, and has been the subject of much interest and endeavor. The advent of modern methods of diagnosis, such as roentgenography and the Wassermann test, have certainly contributed to a greater degree of accuracy in diagnosis, yet they have not fully solved the problem of identifying syphilitic disease of the aorta. The general tendency in modern medicine, unfortunately, has been to place too much emphasis on laboratory methods in the diagnosis of disease. It is not our intention to depreciate the value of the newer methods; we wish rather to emphasize the importance of recognizing them as valuable adjuncts, and to invite attention and interest again to the old, well established methods of physical diagnosis. No one method of diagnosis is infallible, and accuracy, therefore, depends on the intelligent interpretation and evaluation of all methods.

The syphilitic lesion is commonly on the ascending aorta, then on the arch and descending aorta. Klotz's excellent experimental studies and observations have explained many of the problems dealing with syphilitic disease of the aorta. He has shown that the lymphatic supply of the aorta is not uniform, in certain regions the lymphatics are present in great numbers, while in other regions the distribution is meager. The ascending aorta appears to have lymphatics in common with the pericardium, and also communications with a group of nodes that join the lymphatics of the anterior medias-

tinum. Around the arch of the aorta are found lymphatics supplying the aortic wall. These connect with nodes in the anterior mediastinum, with those around the right and left border of the trachea, and with those at its bifurcation. The descending aorta has a variable number of lymph nodes, particularly along its right border, which form a plexus around the exit of the intercostal arteries. This lymphatic system is in direct communication with the two large drainage beds of the body, the one in the thorax and the one in the abdomen. These observations certainly clarify the problems of regional localization of syphilitic lesions on the aorta.

Klotz has shown further that the *Spirocheta pallida* attacks the aorta by way of the small lymphatics accompanying the vasa vasorum. The infection enters from without, and occurs first in the adventitia, with resulting periaortitis. This accounts for the common observation of cohesion of the aorta with the surrounding structures. The early involvement of the adventitia has significant bearing on certain of our succeeding remarks and observations. The periaortitis is then progressively followed by involvement of the media (mesoaortitis) and of the intima (endoaortitis). The pathologic changes of syphilitic aortitis are so well known that a detailed description here is unnecessary, except for the statement that the inflammation is productive in character, with a tendency to reparative fibrosis and resulting deformity. The cicatricial fibrosis has a definite bearing on the progression of the symptoms and on the objective findings of the disease; this will be emphasized later.

One hundred forty patients with syphilitic disease of the aorta were observed by us for a period of from one to eight years. The patients have been studied in three groups, according to the degree of apparent damage which fairly accurately divides the course of the disease into clinical periods: (1) early stage, (2) moderately advanced stage, and (3) advanced stage.

*Read before the Minnesota State Medical Association, October, 1923.

Early Stage.—The early stage of syphilitic aortitis comprises cases in which the characteristic objective findings of aortic disease is lacking, namely, the absence of appreciable cardiac enlargement, murmurs, vascular phenomena of aortic regurgitation, and dilatation of the aorta. Ten of our patients, seven males and three females, were classified in this group. One patient was in the third decade of life, two in the fourth, four in the fifth, and three in the sixth. The marked dominance of males was noted also in the other groups, and supports Stokes' opinion of a relatively increased immunity in women against syphilitic infection. The age of the patient is an important factor, as undoubtedly many years elapse before the disease is evidenced by symptoms. In this group the average time from the occurrence of the primary lesion to the initial examination, was seventeen years. Three of the patients when first examined had no symptoms referable to the cardiovascular system, five had mild dyspnea and palpitation with exertion, and two had typical anginal attacks.

Quite early in our experience with cardiovascular syphilis, we noted that occasionally a patient was encountered in whom the characteristic objective findings enumerated were absent, but in whom a peculiar tambour-like accentuation of the aortic second tone was audible. This peculiar tympanitic accentuation was usually quite well localized to the aortic area, but at times was heard also to the left of the upper sternum. Our first impression was the anticipation of finding hypertension, but sphygmographic studies failed to confirm this supposition. The first patient in whom this peculiar change in the character of the aortic second tone was noted, was repeatedly under our observation during the time she was receiving rigid treatment for syphilis. At the end of nine months a rough, reverberant systolic murmur was audible at the aortic area, and transmitted into the carotids. At the end of two years this patient had the classical signs of aortic regurgitation besides the systolic murmur, and the tambour-like accentuation of the aortic second tone was lost. We have observed this same progression of events in five other cases.

The peculiar character of the second tone was described years ago by Potain, and again emphasized by McRae and by Longcope, but the phenomenon has apparently attracted little attention recent-

ly. The probable mechanics of this distinctive aortic second tone is interesting and logical, in view of Klotz's work. If the fact is recalled that the primary involvement of the aorta occurs in the adventitia and media, one can readily appreciate that these changes will cause alterations in the elasticity or resilience of the aorta, not only through fibrotic changes in the adventitia, but by cohesion of the aorta to contiguous structures. This diminution in the elasticity of the aortic wall in the presence of a competent aortic valve necessarily increases the resistance against the inrush of blood from the heart, which in turn increases the intra-aortic tension and causes rather forcible closure of the semilunar leaflets. This finding cannot, of course, be interpreted as indicative of the presence of periaortitis alone, since undoubtedly the other layers of the aorta may sometimes be involved. We believe that this peculiar tympanitic accentuation of the aortic second tone, in conjunction with other evidence of syphilis, justifies the diagnosis of early syphilitic aortitis. It is so different from the changes accompanying hypertension and atherosclerosis of the aorta that these should not be confused with it. In the latter conditions the second tone is usually accentuated but has a metallic character, or else its quality is not altered, but simply intensified.

In two only of the ten patients did the roentgenograms reveal dilatation of the aorta, and in both instances the dilatation was slight. We have repeatedly been disappointed in the failure of roentgenography to aid us in the early diagnosis of disease of the aorta.

The blood Wassermann reactions were strongly positive in nine patients and negative in one. Three patients had associated syphilitic lesions; one had syphilis of the central nervous system with positive serologic changes in the spinal fluid; one had osseous syphilis, and the patient having the negative blood Wassermann reaction had typical cutaneous syphilis, which was cured completely under treatment. Electrocardiography is of little diagnostic value in these incipient cases; in only one of the entire group were there significant alterations in the graphs, consisting of negativity of the T wave in Derivation I. This patient had angina pectoris.

Five of the ten patients were traced. The condition of three is worse, of one unchanged, and of one improved; none is dead.

Moderately Advanced Stage.—The patients who have been classified for study in the moderately advanced stage of syphilitic aortitis, are those whose examination revealed systolic murmur, usually quite well localized to the aortic area, invariably rough and reverberant in character, and frequently transmitted into the carotids. In about half of the cases the aortic second tone was accentuated, but did not have the peculiar tambour-like quality we have described. There were thirty patients in this group, nineteen males and eleven females. One patient, with typical hereditary syphilis, was in the first decade of life, one was in the second decade, one in the third, seven were in the fourth, eleven in the fifth, twelve in the sixth, and two in the seventh. An average of twenty-one and one-half years elapsed between the primary lesion and our examination.

Six of the thirty patients had no complaints referable to the cardiovascular system, thirteen had varying degrees of dyspnea, palpitation, and other symptoms indicative of an inefficient heart, and eleven had angina pectoris; this latter group will be considered more in detail later. The systolic murmur, with its peculiar reverberant quality, is probably due to the intimal roughening indicative of moderately advanced aortic syphilis. In three cases only did the roentgenograms reveal even slight to moderate dilatation of the aorta, while in many cardiac enlargement was noted.

The blood Wassermann reactions were strongly positive in fifteen patients, negative in twelve, and not recorded in three. The spinal fluids of six patients were serologically positive, and of these, three had negative blood Wassermann reactions; the reaction was not recorded in one. Thus eighteen patients in the group had serologic signs indicative of syphilis. Twelve patients had syphilis besides the cardiovascular involvement; eight of these had syphilis of the central nervous system, two of the osseous system, one of the skin, and one of the liver.

The electrocardiograms of only three patients revealed significant abnormalities. These consisted of T wave negativity, in one case involving Derivation I, and twice affecting combined Derivations I and II. Two of the patients had angina pectoris and the other, severe attacks of paroxysmal dyspnea, conforming to the old entity formerly termed angina pectoris sine dolore.

Eighteen of the thirty patients were traced. Four

report their condition to be worse, six unchanged, and two improved. Two patients died of heart disease, an average of fifteen months after our initial examination. Four patients died of other causes.

Advanced Stage.—Patients whose syphilitic aortitis had progressed to the development of aortic regurgitation were classified as being in the advanced stage. It is needless here to review the classical signs of this lesion. Aneurysm of the aorta, of course, is a manifestation of advanced aortic syphilis, but has not been included in this study since it warrants more consideration than the scope of this presentation will permit. There were 100 patients in this group, of which eighty-eight were males and twelve were females. Three patients were in the third decade, eighteen in the fourth, forty-seven in the fifth, twenty-seven in the sixth, and five in the seventh. An average of twenty years had elapsed from the time the primary lesion appeared until our initial examination.

No one of the patients was free from cardiovascular symptoms, sixty-three had dyspnea, palpitation, and so forth, and thirty-seven had angina pectoris. It is well known that the syphilitic process in the aorta is retrogressive as well as progressive, and that involvement of the aortic valve is almost inevitable in an advancing process. Aortic regurgitation occurs either from cicatricial deformity of the aortic ring, or valve leaflets, or from dilatation of the ring from the associated involvement of the aorta itself. The loss of the accentuation of the aortic second tone or its utter disappearance in the presence of aortic regurgitation, is due, of course, to the failure of the valves to approximate. Occasionally the second tone is accentuated, and such accentuation is the result probably of sclerotic changes of the valves favoring sound production. The roentgenograms revealed aortic dilatation in eighteen patients, in six of whom it was aneurysmal.

The blood Wassermann reactions were strongly positive in seventy-two patients, negative in twenty-five, and not recorded in three. The spinal fluid of fifty-five patients was studied; syphilis was indicated serologically in eighteen, the studies were negative in thirty-seven. Two patients with negative blood Wassermann reactions had positive reactions on the spinal fluid, thus the total serology in this group was positive in seventy-four instances. Twenty-four patients had associated syphilitic lesions, and of these twenty-three had syphilis of

the central nervous system, and one a tertiary lesion of the mucous membrane.

The electrocardiograms of thirty-four patients revealed significant changes, chiefly significant T wave negativities as follows: eight patients had T wave negativity in Derivation I, seven T wave negativity in combined Derivations I and II, nine had T wave negativity in combined Derivations II and III, and in eight patients all the derivations were affected. One patient, besides having the T wave negativity in Derivation I, had QRS complexes aberrant in all derivations. One patient had auricular fibrillation. One of us⁸ previously emphasized the infrequency of auricular fibrillation in aortic disease, in a study of 500 patients with auricular fibrillation disclosing only thirteen aortic lesions. Eighteen of the thirty-four patients with significant T wave negativity had angina pectoris.

Sixty-four of the 100 patients were traced. Thirteen were worse, thirteen unchanged, and six improved. Thirty-one had died of heart disease an average of fourteen months from the time of examination. One patient had died, but the cause could not be ascertained.

PAIN WITH SYPHILITIC AORTITIS

A discussion of the character of the anginal attacks attending syphilitic aortitis is warranted here, since the origin of pain and its distribution are often bizarre. Fifty of the 140 patients in this series had had anginal attacks. Six patients had typical attacks, consisting of severe retrosternal pain, radiating into the left arm, and precipitated by exertion. Twenty-five patients had attacks of severe retrosternal pain without radiation following exertion. Two patients had retrosternal pain, radiating through to the back, to the right side of the neck, and into the right arm, and one patient had pain in both shoulders, radiating to the elbows, brought on by exertion. One patient had pain in the left arm from the shoulder to the elbow with exertion. Three patients had a sense of chest oppression without pain, coming on with exertion. A certain group of cases represented more unusual pain distribution, and are similar to those previously reported.⁹ Five patients had severe middle epigastric pain without radiation, induced by exertion, three had epigastric pain radiating into the chest and into both arms, and one had epigastric pain radiating through to the back, neck, shoulders, and chest following exertion. One patient had

pain in the upper left abdomen without radiation. In one instance the pain started in the dorsal region of the back, and radiated to the right shoulder and arm. The frequency of atypical pain manifestations in syphilitic aortitis, emphasizes the importance of careful questioning in obtaining histories of diagnostic value.

GENERAL DISCUSSION

The classification adopted for this study is purely arbitrary. It has been based on objective findings to enable us to stress the importance of physical diagnosis, an art which, regrettably, is becoming unpopular. We have already conceded that this classification may not always coincide with the findings of the pathologist with regard to degree and extent of involvement, yet it enables the clinician to group his cases according to apparent damage.

It is important to realize that a long period elapses from the appearance of the primary lesion of syphilis to the onset of symptoms indicative of invasion of the aorta. In this study the average time elapsing from the time of the appearance of the primary lesion to the time of our initial examination was nineteen and one-half years, and in most instances symptoms referable to the cardiovascular system had been present but a few years. It is essential, therefore, always critically to search for cardiovascular involvement in cases of syphilis, and persistently and repeatedly to examine such patients over long periods.

We wish briefly to recapitulate the results of some of our special laboratory methods. The blood Wassermann reactions were strongly positive in ninety-six of the patients, and the spinal fluids of twenty-four of the patients indicated syphilis. In five patients in whom the blood Wassermann reactions were negative, the spinal fluids were positive; the total positive serology was 101 (72 per cent). Larkin and Levy reported positive Wassermann reactions in 90 per cent of patients with syphilitic aortitis demonstrated histologically whose syphilis had existed for about fifteen years. Some of their patients may have been free from objective clinical signs of syphilitic aortitis, thereby bringing the percentage of positive reactions higher. In only twenty-one of the patients did the roentgenograms reveal dilatation of the aorta.

From the foregoing data it is obvious that neither Wassermann reaction nor roentgenography is infallible in the recognition of aortic syphilis. On

the other hand there was no instance in this study in which physical diagnosis failed to reveal evidence indicative of disease of the aorta. These results, we believe, entirely justify our stand in emphasizing the importance of physical diagnosis, which must always rank with the subsidiary yet valuable laboratory adjuncts.

Electrocardiography is helpful only in corroborating advanced disease of the aorta, especially when cicatricial fibrosis has involved the coronary orifices. The most common graphic abnormalities encountered in our cases were significant T wave negativities, occurring in thirty-seven patients; twenty-one of these had angina pectoris. One of us¹⁰ has previously emphasized the frequency of these graphic changes in angina pectoris, presumably due to coronary sclerosis. Our findings in this study also favor the concept repeatedly expressed, that T wave negativity results from myocardial effects produced by changes in the circulation of the heart itself.

In the advanced stage of aortic syphilis particularly, even during intensive treatment for syphilis, subjective, objective, and graphic evidence of progression may often be observed. We have repeatedly noted the onset of anginal attacks, or seizures of paroxysmal dyspnea, and the development of significant T wave negativity in the electrocardiogram. Two possibilities are at once suggested: (1) in advanced aortic syphilis the damage and deformity are so marked in many instances that progression occurs in spite of rigid treatment, and (2) when treatment is effective in controlling the syphilitic process, the resulting reparative fibrosis produces deformity leading to progressive cardiovascular impairment. This is especially true in the atresia of the coronary orifices, often observed at necropsy, when the effect on the heart is identical to that produced by obliterative arteriosclerosis of the coronary arteries themselves.

In the early stage of the disease no cardiac deaths occurred. In the moderately advanced stage, cardiac deaths occurred in 11 per cent of the patients, while in the advanced stage, heart disease produced 48 per cent of the deaths. The total cardiac mortality was 38 per cent.

It is important in this connection that, of the thirty-seven patients having significant T wave negativity in their electrocardiograms, eighteen (49 per cent) have died of heart disease; in other words, 55 per cent of the total cardiac deaths oc-

curred when these changes existed. We have repeatedly called attention to the serious prognostic significance of this graphic abnormality.

We believe that we have submitted data that emphasize the necessity for and the importance of the early recognition of aortic syphilis. The fact that only ten (7 per cent) patients with early syphilitic aortitis were found in this study, that thirty (21 per cent) were in a moderately advanced stage of the disease, and 100 (71 per cent) had advanced aortic involvement, indicates that the early recognition of aortic syphilis is not frequent. Tuohy, in a comprehensive review of aortic disease, has also called attention to the necessity of its early recognition. The frequency with which cardiovascular syphilis is noted, indicates that more intensive and prolonged treatment of all patients with syphilis is necessary, since the prevention of cardiovascular involvement implies, of course, an arrest of the etiologic disease before permanent and irreparable vital damage shall occur.

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DISCUSSION

DR. JOHN A. STOKES: As a student of syphilis watching Dr. Willius' almost uncanny instinct for the earliest signs of aortitis, I have come to appreciate the immeasurable value of expertness in physical diagnosis in the early detection of this, the gravest complication of syphilis. As he says, the ear and not the blood Wassermann reaction or the x-ray,

detects the earliest sign of syphilitic aortic disease. The average diagnosis of syphilitic aortitis is made many years too late for favorable therapeutic results, although by a proper selection of cases even then a presentable showing may be made. Mortality statistics now being collected appear to err in applying new methods for detecting failure to old notions of case selection, making the outlook seem unduly black.

Observation for an aortic lesion should begin in every syphilitic by the second year of his infection regardless of blood findings. The expert opinion of a cardiologist is invaluable in patients who present relapsing or persistent positive blood Wassermann reactions. We should treat latent syphilis within the first two decades of the disease, even though the positive blood Wassermann is the only sign. The vascular involvement which may be present may not be detected until much damage has been done. One should not be misled into overlooking the vascular system because the patient offers some other presenting symptom of syphilis and makes no vascular complaint. In addition to careful physical examination it is well to question syphilitics closely in regard to precordial strain on exertion and shortness of breath, to which they may have given little attention. I know I seem radical, but I believe we should treat vigorously for syphilis, young men with aortic systolic murmurs even in the absence of the grossly obvious history or findings of syphilis, provided a reasonable case may be made out for exposure to the risk of acquiring the disease. At least no harm will be done and often much good. Think of rheumatism late rather than early among the possibilities and give mercury, iodides and arsphenamine the preference over tonsillectomy as a therapeutic test.

That periaortitis is the principal pathologic change in early syphilis of the aorta is shown by therapeutic tests on supposed solid tumors of the mediastinum which develop aneurysmal pulsation with disappearance of symptoms under treatment.

Accentuation of physical signs and even apparent progress of the lesion may take place in treating early syphilitic aortitis. A therapeutic paradox unfolds under your ear, in that the patient with a tambour second sound develops a murmur as healing sclerosis stiffens his aorta and distorts his valves. A patient with a systolic murmur may develop a diastolic bruit and slight temporary decompensation as treatment takes effect. Such signs are confirmatory and observation shows the process to be arrested, not progressive.

Vigorous treatment with mercury and iodide for weeks, followed by arsphenamine in early cases without marked coronary sclerosis or myocardial degeneration, yields excellent results. Arsphenamine is often disastrous in patients with pronounced symptoms of coronary obstruction such as severe and long standing angina pectoris, or with the electrocardiographic evidence of myocardial damage mentioned by Dr. Willius. Death of the patient from the healing of his lesion is the therapeutic paradox which follows the obliteration of a diseased coronary artery by the too rapid effect of modern treatment. Exceptional late cases may through localization of the process high in the aorta escape coronary occlusion and may respond well to intensive measures. We should in general select cases on

the basis of coronary symptoms and electrocardiographic signs, not merely Wassermann tests.

DR. HENRY L. ULRICH, Minneapolis: I am glad Dr. Willius brought this subject up for discussion. Twenty to thirty years ago when they were treating syphilis by waiting until the secondaries appeared, the number of aortitis cases must have been larger than today. Chronic syphilis today has a more subtle aspect than in those days because of the improved therapy. Likewise we must approach the diagnosis of aortitis in a more subtle manner. The physicians of the older schools are to be admired for many things. They knew and recognized aortitis. One of their admirable qualities was their reliance on their eyes, their ears, their hands. We have had the tendency to drift away from fundamental clinical methods and depend on laboratory diagnoses. In aortitis particularly we must get back to the education of our eyes, our hands, and our ears. And the more delicately we train these organs the earlier will be our diagnosis of this disease.

It would be very interesting to know the percentage of aortitis present in the syphilitic clinics today. It would be interesting to check up the therapeutic efficiency of these clinics by the number of patients with aortitis in later years. As the years go by, syphilitic aortitis ought to be a vanishing disease if our therapeutics is correct. Again, how many syphilographers ever warn their patients of the possibility of aortitis or even think of the aorta in the problem of a syphilitic case. Yet syphilitic aortitis is a common finding in visceral syphilis at necropsy.

Clinically it has not been stressed that there are four groups of this disease: aortitic, aneurysmal, anginal and cardiac (or valvular). In the cardiac there is the "silent type" in which there are no symptoms referable to the heart. In the cardiac group when there is decompensation the heart rarely comes back; it is the beginning of the end. This is an interesting point and differs in this particular from the rheumatic type of aortic disease.

DR. EDWARD L. TUOHY: This subject of aortitis has interested me for a long time and while there is a great deal that might be said on the subject I think we should confine our attention rather definitely to the points brought out so very well by Dr. Willius. It is very evident from this study and any other study that has been carefully done that early aortitis is largely overlooked and has to be surmised. We know (and it places a heavy responsibility on us) and realize that these late manifestations of aortitis mean that these patients have had something very definite there long before, but we were unable to discover it.

Applying ourselves to the ten per cent and to the definite recommendation made by Dr. Willius that we pay special attention to this exaggerated second aortic tone, I agree with that very heartily. Clifford Alburt refers to it as the "bruit de taburka" and gives the credit for the elucidation to Potain. Tones of any sort are subjective. If we could reproduce these notes so as to vivify them externally we would have something that is not made within our own heads, for comparative study. However, it is only by the keenest education of the ear that this particular tone may be differentiated from various other accentuations. It is difficult and it must come largely through personal experience.

While we are on that point, Hoover, of Cleveland, has had much to say relative to his personal ability to diagnose early aortitis by percussion and that introduces again the personal factor, which is, on the whole, most undeterminative. He also draws attention to this fact that anything that will pull the lung away from the aorta in that region will bring the aorta closer to the chest wall and will therefore accentuate that tone. That is exactly what we get occasionally with apical tuberculosis on the right side and I have seen this phenomenon. That is one place where you would have to be cautious as to whether you have tambour tone or not.

In the second and larger group systolic murmurs should be the subject of careful study because systolic aortic murmurs are usually due to the intimal atheroma and this intimal induration has nothing to do with syphilis. So it is well to point out that wherever we have evidence of general atherosclerosis (eye grounds—peripheral arteries, etc.) we should make these deductions with great care. The young individual with angina (definite angina, before forty-five) will probably, if you observe them long enough, develop syphilitic aortitis and the classical phenomena that go with it. The development of the various other signs are unfortunately all too common.

Regarding the Wassermann test: I have followed a number of individuals in whom I made the proper surmise that they had syphilitic aortitis and did not have the courage to substantiate it definitely because they had a negative Wassermann test. I have watched these patients come back later and they have had definite aortitis. This paper placed the whole matter definitely before us. Certainly we have no easy short-cut to eliminate the difficult problems in early diagnosis as presented in this field.

DR. C. N. HENSEL: There are two or three points that should be emphasized in this excellent paper of Dr. Willius. The first is the fact that his statistics, corroborating other statistics, show about 74 per cent positive Wasser-

manns in the presence of active aortic change. The second is that his group of early cases, which are the important cases to diagnose—because that is the time when treatment is most effective—was only 10 per cent. The third is that he finds the early stages of aortitis are given scant attention. We can easily discover aortic aneurysms or an aortitis with heaving of the arch of the aorta and the more marked signs. These are the cases we may all recognize, but the cases we *should* recognize are the 10 per cent that Dr. Willius tells about; but, as Dr. Tuohy has said, the absence of a positive Wassermann test makes us fearful of going ahead in the treatment of these suspected cases.

I first saw a man, 45 years old, five years ago, whose symptoms were throbbing heart, sternal oppression, weak heart tones and lack of physical endurance, with a large flabby heart, wide at the base. I looked at him through the fluoroscope, but could see no pulsation of the aorta. He had five negative Wassermanns and had three more in other clinics. In 1920 somebody began to give him arsphenamine and mercury. I recently looked at his heart under the fluoroscope and now he has a most beautiful pulsating aneurysm of the descending thoracic aorta, with a heart beat of seventy-two, an increase in his physical endurance and apparently the lesion is perfectly compensated. He has had continuous treatment from 1920 on. This man has never had a positive Wassermann. I have three other cases with negative Wassermanns and symptoms of aortitis.

When you get a man from 35 to 45 with substernal oppression or even severe pain deep in the sternum and a muffled aortic second tone, or an aortic regurgitation alone without any mitral involvement you can be suspicious of syphilis. Sometimes a young case, without a history of rheumatism, with no mitral involvement and with but a slight aortic regurgitation and the other combined symptoms, even in the presence of a negative Wassermann, should make us suspicious of syphilis of the aorta and treat for that.

TRICHINOSIS IN NEW YORK STATE

Recently there have come to the attention of the Department reports of three outbreaks of trichinosis in this State; one of these occurred in Rochester, one in Yonkers, and the third in Patterson, a small village in Putnam County. The Rochester epidemic consisted of seven cases in one family, all of whom ate raw pork which had been purchased in a public market about Christmas time. In Yonkers there were ten cases, four of whom were in one family, two in another, and one case in each of four other families. It has been impossible to trace the source of the pork eaten by these people. From investigations made it seems that it had not been purchased in any one establishment; some of it had come from stores which claim to handle only western dressed carcasses; in some instances it is claimed that the pork was a present from friends, and in others that it was purchased in the form of sausage from a peddler from New York City. The Patterson cases were a mother and a 21 months' old baby who ate home-grown pork; no other cases have been found in the neigh-

borhood. Three of the Rochester cases were fatal, while none of those in Westchester County died. Laboratory confirmation having been obtained in all cases there can be no question regarding the diagnosis.

Trichinosis in the human can be prevented only by abstaining from pork which has not been thoroughly cooked; a temperature of 160 degrees F. is necessary to destroy the infecting organisms. The United States Department of Agriculture states that no system of inspection is sufficiently certain in its results to prevent the sale of pork infected with trichinosis.

Health officers and other physicians should be on the lookout for trichinosis. The physician who attended the Yonkers cases states that he is convinced that there have been many cases in Westchester County but which have been diagnosed as gripe. He points out the frequency with which edema of the eyelids occurs in this disease, which, combined with symptoms of so-called gripe, should lead one to have a blood count made at once; if trichinosis is present there will be a well-marked eosinophilia.—*New York Health News*, Vol. 1, No. 7.

THE ANATOMY AND MECHANICS OF FRACTURES OF THE FEMUR*

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In the consideration of any fracture it is impossible to confine the discussion of the lesion merely to the bone itself as the surrounding tissues are the more important factors and are responsible for most of the complications which occur. This is especially true when taking up the anatomy and mechanics of a fracture and the problems of treatment are greatly simplified if these two subjects are thoroughly understood. The object of all treatment is, of course, to put the parts involved into their normal positions and to hold them there while healing is taking place and if one does not know the normal contour of the bone or bones involved or the various factors which tend to prevent the normal anatomy from being obtained it is impossible to intelligently handle any fracture. With fractures of the femur we must not only know the anatomy of the bone and the relation of the muscles, fasciæ, blood-vessels, and nerves to the bone and to each other but also the anatomy of the hip and knee joints and the function of these joints as related to such fractures. A knowledge of the extrinsic and intrinsic forces which cause the femur to break, which cause deformity after fracture has taken place, and which aid or hinder reduction, is also necessary. The physical properties of bone, elasticity and strength, must not be forgotten. No new facts or principles in the anatomy or mechanics of femur fractures can be given, but a brief review of what we already know will serve as an introduction to the papers on treatment which follow.

The femur is the longest and on the whole the strongest bone in the body and is a perfect example of the adaptability of shape to function in the human mechanism. The superincumbent weight of the body must be transmitted through the bone in an infinite number of positions and directions even during the ordinary daily activities of any individual and the forces applied both from the outside and by muscular action are equally numerous. We have therefore a heavy bone with a well marked forward convexity of the shaft and a strong rein-

forcement posteriorly in the form of a bony ridge, the "linea aspera," which latter adds great strength with relatively little increase in weight. The angle of the neck of the femur, which averages about 127 degrees, is necessary in order that the rotations and more complicated motions of the hip can be performed; but to prevent weakening from the angulation at this point a wonderful structural framework has been developed. The cancellous bone with which the head and neck is filled is so arranged that the supporting lamellæ are placed in the line of greatest pressure and by a truss-like arrangement distribute the forces applied through the head to the shaft of the bone. There is also a massing of bone on the under surface of the neck and a reinforcement in the body of the neck in the form of a vertical plate of bone, called by Bigelow the "true neck" of the femur and by Merkel the calcar femorale, by which latter name it is now commonly known. The greater trochanter bears no weight and is consequently very light in structure. The lower end of the femur is, like the head and neck, filled with spongy bone and the walls here become very thin in marked contrast to the thick wall of the shaft. The lamellæ of the condyles run mainly in the vertical and transverse planes.

The hip joint is a ball and socket joint which, although not as mobile as the shoulder, on account of the depth of the acetabulum, allows a remarkably free range of motion. This freedom of motion is a factor which makes possible the efficient use of traction in the treatment of fractures of the shaft of the femur and which allows the greatest liberty to patients when suspended splints are used, for no distorting force can then be transmitted through the joint to the line of fracture until after the limit of motion has been reached. In the knee joint we have almost a pure hinge motion and as long as the collateral ligaments are intact any lateral or rotatory movement of the leg must be directly transmitted to a fracture above the joint. With fractured condyles a knowledge of this stability of the knee joint is of prime importance.

The fascia lata plays an important part in fractures of the femur and a review of its anatomy is necessary if a proper understanding of the mechanical action of traction in treatment is to be understood. This structure, the deep fascia of the thigh, encircles the entire thigh and forms a complete covering for the muscles of the thigh and buttock. It is firmly attached above to the bones and ligaments

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of the pelvis and is continuous below with the fascia of the leg but is also attached to the borders of the patella. The lateral portion of the fascia is greatly thickened and is known as the ilio-tibial band. To the upper part of this is attached the tensor fasciæ latæ and part of the gluteus maximus muscles. There are two strong bands of connective tissue connecting the femur with the fascia lata and these act as septa between the muscle bundles. One of these, the medial intermuscular septum, runs from the medial lip of the linea aspera between the adductor magnus and the vastus internus muscles; and the other, the lateral intermuscular septum, from the lateral lip between the short head of the biceps and the vastus externus muscles so that the extensor group is separated from the flexors and adductors. The importance of this great fibrous sheath with its longitudinal attachments to the femur by means of the intermuscular septa is readily seen. The muscle bundles which fill the compartments between the connective tissue septa are not only held in their proper place but the forces acting through them are guided and modified by this structure. The normal tenseness of the fascia is relaxed whenever a fracture of the femur with shortening occurs and it is then that the various degrees of deformity can take place. Traction on the extremity will tighten the fascia and this structure will then tend to mold the muscles and other structures into their normal positions. The tension on the muscles caused by traction is, of course, also an important factor but the rôle of the fascia lata cannot be minimized. If we can imagine a thigh with all the muscles removed but with the fasciæ still intact we can visualize what must take place when we have a fracture of the femur. With the tension relaxed any amount of deformity or shortening can be obtained but when traction is made on the limb this is overcome and the femur will at least approximate the normal contour on account of the action of the intermuscular septa attached to the linea aspera.

The blood-vessels and nerves of the thigh are sometimes, although rarely, injured in fractures of the femur as they occur in civil life. These injuries, when they are present, usually follow fractures in the lower third of the bone as it is here that the relation of the bone to the vessels and nerves is most intimate. The popliteal artery and vein and the internal popliteal nerve, in the order named, are the structures most likely to be involved

for they lie practically on the popliteal space of the femur and can apparently be easily torn or pressed upon by the posterior displacement of the lower fragment in supra-condylar fractures or later involved in the callus formation. The rarity of such injuries, however, seems to show that this danger has probably been over-emphasized.

The muscles of the thigh need not be taken up from a purely anatomical standpoint as the discussion of the various fractures will bring out the important points in their relation to such fractures. In the vast majority of femur fractures there must be shortening of the extremity due to the powerful pull of the muscles running from the pelvis to the tibia and also to the force exerted by the muscles having their origins or attachments on the femur itself although these latter contribute more to the deviating deformities.

All types of fracture, from simple fissures to extreme comminution, have been described in the femur. No portion of the bone escapes fracture but there are some locations which are involved more frequently than others and as a result certain typical fractures are usually described. The mechanism and anatomy of only the more important of these can be taken up at this time.

Fractures of the neck of the femur are usually caused by direct falls or blows on the greater trochanter but there are also many cases on record where more indirect forces have produced these lesions. In the aged, where we always find absorption of the calcar femorale, thinning of the cortical bone, and a fatty degeneration of the cancellous bone, very slight injuries may result in severe fractures, and falls on the knee, the forcing of the extremes of all the motions except flexion, and muscular action, although rarely, can be causative factors. If the fracture is near the head (the so-called sub-capital type), the fragments may be impacted by the driving of the denser neck into the head or be found in any degree of separation. Usually a part of the periosteum remains intact and the circulation to the head fragment is thus maintained. Impaction itself has no relation to the viability of the head as the circulation must come from the periosteum. Fractures at or near the base of the neck usually result in the firm bone of the neck being driven into the cancellous tissue of the greater trochanter and thereby frequently causing a splitting of the latter and the formation of several other secondary fractures. The trochanter may be sepa-

rated and drawn inward and the lesser trochanter may be split off with a portion of the shaft by the wedging action of the fragments. The old classification of intra- and extra-capsular fractures is one that cannot be followed, as a true extracapsular lesion of the neck is anatomically impossible and for the purposes of treatment and prognosis this division is of no importance. Most fractures of the neck of the femur show a rather typical deformity of shortening and eversion. This eversion is not only due to the action of the external rotators of the thigh and the weight of the limb but also to the fact that compression and comminution is more extensive in the posterior part of the neck on account of the more fragile bone in this location. The shortening is mainly due to the glutei, adductors, rectus femoris, and the hamstrings.

Isolated fracture of the greater trochanter is rare but can be caused either by direct blow or by muscular action. Separation of the fragment is not as a rule great, due to the tendinous fibers which so envelop it and the adjoining shaft. The lesser trochanter is fractured even more uncommonly but a few cases have been reported where the pull of the psoas and iliacus muscles in attempts to prevent a fall has separated it from the shaft.

Fractures of the shaft of the femur are usually described in three groups: those in the upper third, those near the center, and those in the lower third. Fractures in all these locations may be caused either by direct or indirect violence or, more rarely, muscular action. All types of fracture are common and the pathology depends on the nature of the force causing the break and the part of the shaft involved. In the upper third the line of fracture is typically forward and outward while in the lower third it is forward and downward. In the center the planes are transverse or slightly oblique, and if the latter, the forward and downward line is present. The normal curves of the bone seem to be important factors in causing the obliquity. Displacement and deformity is the rule in all shaft fractures unless the break is transverse without separation of the fragments, or incomplete.

With a fracture in the upper third the rule is that the proximal fragment is displaced forward and outward due to the action of the psoas and iliacus, the two lesser glutei, and the external rotators, all of which are so inserted into this fragment that their combined action tends to cause such a deformity. An important modifying factor, how-

ever, is the action of the distal fragment on the proximal one when the former is drawn upward by the powerful pull of the rectus and hamstring muscles. This pressure increases the angulation and may be strong enough to displace the upper fragment inward or backward in spite of the action of the muscles tending to cause the opposite deformity. The distal fragment in these upper third fractures is displaced as a rule upward and inward and is also everted or externally rotated. This is due principally to the action of the pectineus and the adductor group of muscles which are inserted into the medial lip of the linea aspera although, of course, the retraction is caused mainly by the rectus and the hamstring muscles as just mentioned.

There is no typical deformity in fractures near the center of the femur but in simple types the factors at work are similar to those just described. Fractures in the lower third or just above the condyles, however, show usually a displacement of the distal fragment backward on account of the action of the gastrocnemius and, to a lesser extent, the popliteus and plantaris muscles. The angulation of this fragment is rarely as marked as the diagrams in the text-books would lead us to believe and the pull of the long muscles of the thigh causing retraction and overlapping is a much more important factor. The upper or long fragment changes little in position in this fracture except that it tends toward a position of adduction and slight flexion by the action of the adductor group and the hip flexors. The sharp end of the upper fragment may penetrate the muscles on the front of the thigh and even go into the knee joint.

In all shaft fractures it must not be forgotten that the line of fracture influences the displacement to a great extent and the typical deformities and displacements just described are frequently absent on this account. The fragments tend to slide apart, when retraction takes place, along the line of the obliquity of the fracture and if this obliquity acts contrary to the usual deforming forces the latter are overcome or altered. The primary fracturing force may also be so severe that the fragments are driven into unusual positions. If a certain amount of periosteum is left connecting the fragments of a fracture this tends to hold the ends close together and although marked angulation may take place large degrees of over-riding are impossible. Gravity is also a force not to be overlooked as a deforming factor and the posterior bowing which must be

fought against constantly in the treatment of shaft fractures is largely due to this cause.

Fractures of the lower end of the femur are not so important as those of the shaft or neck from a mechanical or anatomical standpoint as the causative factors are practically always some form of direct violence and displacement when present is due to this violence. The usual lesions are fractures of one or both condyles and the intercondylar fracture. This latter may be associated with a supra-condylar fracture and be secondary to it, as the force can be so great, as in a fall from a height, that the lower end of the shaft is driven between the condyles like a wedge. A fissure with more or less separation of the fragments results.

The present absurd state of affairs cannot be allowed to continue, of waiting until a child enters school to find defects which should have been recognized and corrected years before. We therefore, as health officers, stand solidly back of any movement which will make it accepted practice to have the family physician not give up his responsibility when the baby is one year old, but have him continue his visits, at least once a year thereafter, for the recognition and correction of defects and for general advice concerning the child's welfare. If this is done, most children will enter school well nourished and without defects which handicap them in their progress and which, if corrected during the school session, involve weeks of inefficiency until there has been recovery from the operation itself and time for the benefits to develop.—*E. C. Levy, M.D., Am. Jour. Pub. Health, Dec., 1923.*

The American Medical Association is now in its seventy-seventh year. Surely there must be some reason for the continued existence of medical organization in this country. Surely it has a destiny to fulfil and I believe it will fulfil its destiny. I am not one of those that believe that the medical profession has lost the confidence and esteem of the public, the real medical profession, but I do believe that there are tendencies cropping out here and there and yonder which need to be stemmed and that it is the job of the medical organizations to initiate measures that will stem and correct them.

That is not only my opinion, that is my conviction, and I want to say, gentlemen, while it occurs to me, that we need as much as anything else in the medical profession and in medical organizations men with convictions. Everybody has opinions, few have convictions. Opinions will not get us anywhere. It takes convictions to put things over; organized medicine needs convictions. We need leaders in our county, district, state and national associations with convictions, militant men who will initiate the measures that may be needed to correct untoward tendencies upon the part of a few, those that bring reproach upon the whole profession. There is a big job for medical organization today within the profession itself.—*Dr. Olin West, Secretary A. M. A.—From M. S. M. A. Address, 1923.*

THE NON-OPERATIVE TREATMENT OF RECENT FRACTURES OF THE FEMUR*

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Notable improvement in the treatment of fractures has resulted from experience gained in the World War, especially in recent compound, comminuted and infected fractures. The mortality is less and the permanent disability and period of convalescence considerably shorter. So much has been published concerning this matter that even the public has become informed of modern methods of treatment, with the result that patients, insurance and compensation adjusters, and employers are demanding better and quicker function.

The value of reconstruction surgery is recognized and appreciated; however, by a proper appreciation of conservative and non-operative methods in the care of fractures of the femur, immediate operation and the necessity for reconstruction surgery may often be avoided. Each fracture is a problem in itself; the treatment varies, and the attending surgeon is best able to judge of his ability to obtain the desired results with the means at his disposal. Methods possible in hospital practice may be impractical for the general practitioner in treating isolated patients.

CAUSES OF COMPLICATIONS FOLLOWING TREATMENT OF FRACTURES

Seventy-five per cent of cases of fracture of the femur at the Mayo Clinic present malunion, non-union, delayed union, chronic osteomyelitis, or joint stiffness following treatment elsewhere. A study of the causes of such failure demonstrates incomplete reduction and imperfect fixation or retention when first treated. Infection in compound or operative fractures often results in malunion and osteomyelitis. Improper internal fixation and inefficient postoperative retention or external fixation are not uncommon. Failure to recognize fractures of the femoral neck, and too early weight-bearing are occasional causes of non-union and coxa vara. Henderson has reported 1,000 cases of old fractures, 221 of which were of non-union of the various long bones. Of 120 cases of ununited fracture of the hip, only twenty-six were considered

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surgical; ninety-four patients were dismissed since their condition was considered non-surgical. Henderson says, "There is no reason why, in the majority of cases, bony union cannot be obtained in the neck of the femur, if proper fixation is provided after reduction of the fracture." In 222 consecutive cases of fracture of the femur, fifty-seven were recent, the remaining 165 were mal-united or ununited, and the result of treatment elsewhere. Our experience in the Clinic, therefore, may be considered greater along the lines of complications following fractures, and reconstruction; and such an opportunity to study the cases should afford an insight into the causes of failure of treatment of recent fractures, and the means of avoiding them.

AGE AS A FACTOR IN UNION AND DEFORMITY

In the care of femoral fractures the age of the patient is of considerable importance. It is common knowledge that union occurs more rapidly and easily in youth than in old age. Fractures involving the epiphyseal line before a person is fully grown may result in mal-development and bony deformity with joint incongruity, and epiphyseal separation or fracture without displacement should be looked for. Deformity in later life, of slow development, may often be traced back to injury in youth, and radiograms will reveal damaged growth of epiphyseal ends, not uncommonly seen as genu valgum or varum, or coxa vara. Greenstick fractures are common in children, rare in adults. The patient's age sometimes determines the type of treatment; children endure recumbency, fixation, and so forth, far better than do older persons, as demonstrated by the relative infrequency of bed sores and hypostatic congestion. The average healthy adult desires freedom from apparatus and complains bitterly of the recumbency and confinement. In the growth of the shaft, nature has shown a tendency to straighten the less deformed malunions. In the aged, it is sometimes best entirely to disregard the fracture and to treat the patient, accepting deformity in order to save life.

SITE AND TYPES OF FRACTURES

The site and type of fractures demand consideration. The more common fractures of the femur may be classified into three main groups: simple, compound, and pathologic. More specifically they may be considered as transverse, spiral, comminuted or infected, extra- or intra-articular, or epiphyseal.

The usual sites of femoral fractures are: (1) the head and neck (epiphyseal separation); (2) the trochanter (trans-trochanteric, with or without separation of the lesser or greater trochanter); (3) the shaft (upper, middle and lower third), and (4) the condyle (lower shaft).

Estes has reported 584 cases of fracture, including 100 of fracture of the neck, nineteen through the trochanter, 457 of the shaft, and eight of the condyles. He found transverse types common, and spiral and longitudinal types rare.

The position of the fracture is influenced by muscular pull and the weight of the lower extremity, and a thorough knowledge of anatomy is essential if the various forms of treatment are to be applied in such a way as to insure proper results. The difficulty in standardizing treatment is obvious, if one attempts to deal with the age of the patient, and the duration, site, and types of fractures.

TREATMENT

The routine examination and treatment used at the Clinic in all cases of fracture are as follows:

A roentgenologic examination is made on admission, before the application of permanent apparatus, and after applying a temporary splint to relieve pain. A general examination is made, and the history taken, if possible, while the roentgen-ray plates are being developed. As soon as possible after ascertaining the type and location of the fracture, and assuring ourselves of the patient's general condition, anesthesia is given, and the fracture reduced. Roentgenograms are made following reduction and application of apparatus as a record, to assure ourselves and the patient that reduction has been effected. The apparatus is examined several times daily to insure proper function. Measurements are recorded from time to time, as shortening indicates bowing or slipping by of fragments. The circulation is watched, as tight-fitting apparatus interferes with rapid union, makes the patient uncomfortable, his joints stiff, and so forth. Roentgenograms are made on the fifth day, and repeated at intervals thereafter, as the judgment of the surgeon dictates, and always at the time of dismissal. The Wassermann test is made. The details of convalescence, complications, and so forth, are noted from time to time. The extremity is elevated whenever possible, thus improving circulation, preventing edema, and aiding the nurse in the care of the patient. The patient is treated on the Bradford frame and apparatus (Fig. 1),

which can be raised and lowered for the use of the bed pan, for transportation, and so forth, thus aiding the maintenance of reduction by eliminating strain. The union is tested to corroborate the roentgen-ray findings with regard to union before the patient is dismissed. Routine roentgenograms are made at right angles; often the anterior view shows apparent reduction while the side view shows malposition. Weight-bearing is permitted gradually at the beginning of the ambulatory period. An accurate record of the condition, such as length

followed by long convalescence, and not infrequently by permanent partial disability, due to stiffness of the knee, fibrous union or non-union, and shortening. We have come to regard impacted fractures with suspicion and, unless satisfied of the excellent position of the fragments, prefer to break them up, unless the patient's general condition, such as age or constitutional disease, indicates the more conservative treatment. Routine roentgenograms of injuries in the region of the hip have often led to the discovery of an impacted fracture which

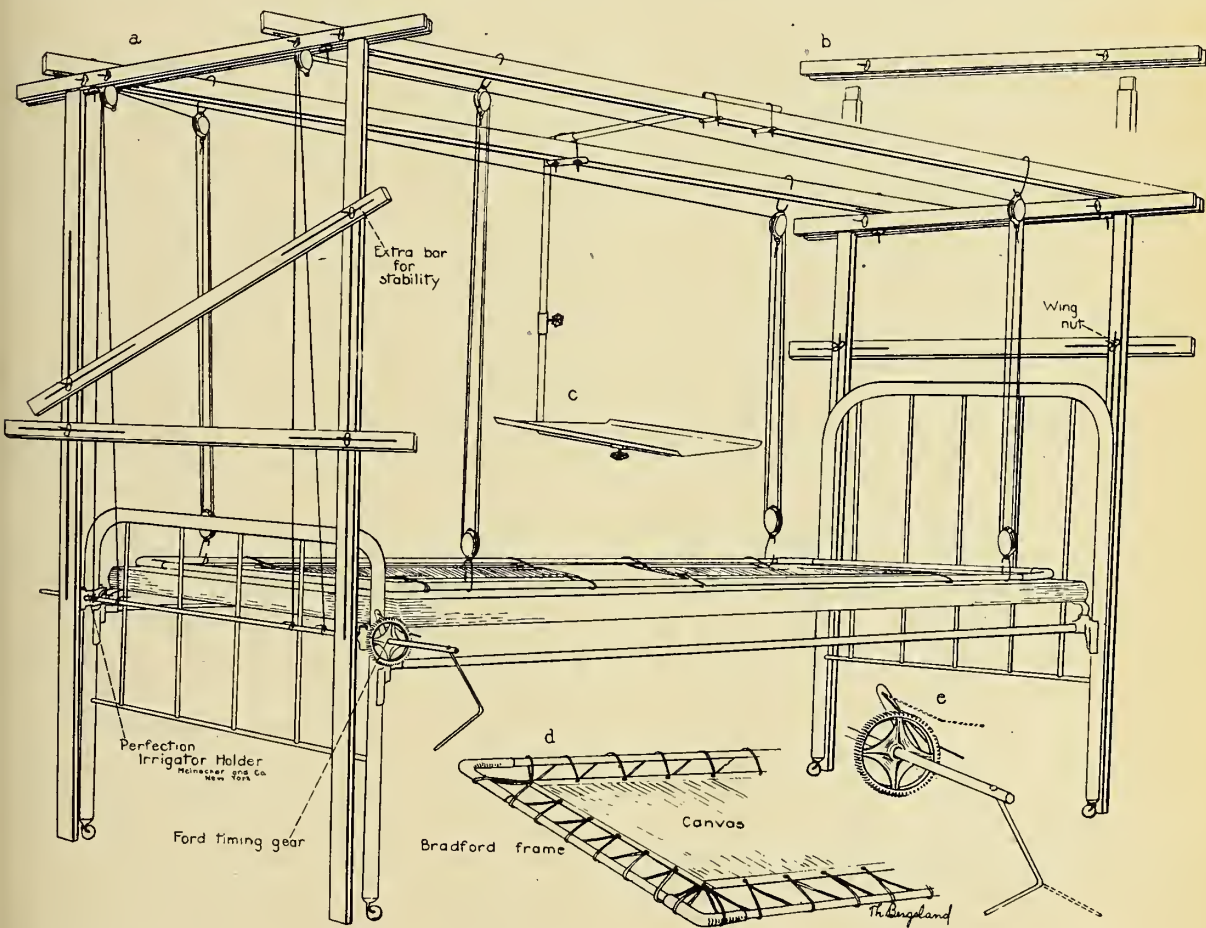


Fig. 1. Modified Balkan frame used with Bradford frame, the latter being raised by crank and pulleys. Adjustable food and reading table. (a) Balkan frame. (b) Method of knocking down frame. (c) Table. (d) Bradford frame. (e) Gear with "dog" and adjustable crank.

of extremities, and mobility of joints, is made when the patient is dismissed from observation. With such treatment carefully carried out, the patient will secure good results, and with such records available, the physician will be protected against any future complaint.

Fracture of the head, neck, or trochanter.—Fractures of the femoral head, neck, or trochanter are

otherwise would have been overlooked, and which accounts for retarded convalescence following so-called sprains, and the later development of non-union and coxa vara. For fractures of the head and neck, the Whitman reduction and fixation method is used almost exclusively in the Clinic; it affords excellent results, and is applicable in most instances. The Ruth-Maxwell method has

also been employed; if it is, watched carefully, it is no doubt excellent. Once the Whitman cast has been applied with proper reduction, little care is required, other than prevention of pressure, sores over the sacrum, and stiffness of the knee. We apply the cast from the mid-thorax to the toes on the affected side, and to the knee of the sound leg (Fig. 2); a large window is left to permit massage of the patella, and the sacrum is well padded with

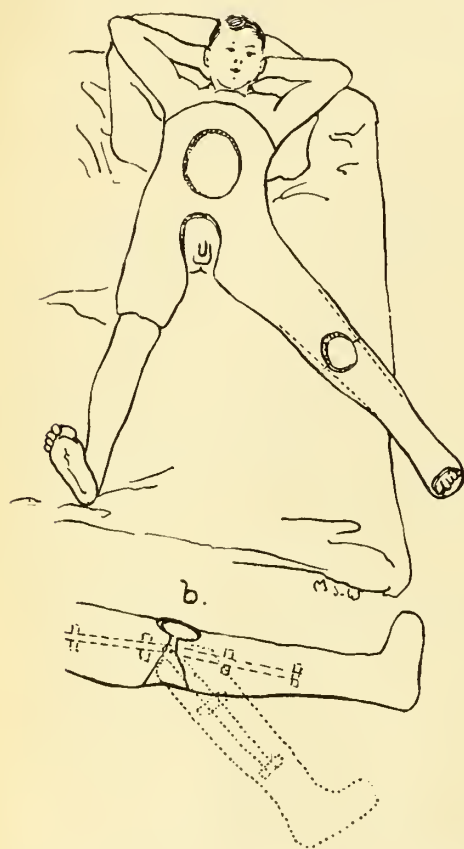


Fig. 2. (a) Cast applied, following Whitman reduction, extends from the thorax to the toes on the fractured side and to the knee on the sound side. A large window is left over the patella and the abdomen. (b) Author's method of preventing knee stiffness by means of hinges placed in the cast; later the cast is cut so as to allow knee motion.

soft felt. Care is taken to maintain the lumbar curve; in obtaining this, the back rest I devised is of value. After six or eight weeks, a pair of metal joints are placed on either side of the knee, and held by plaster until firmly fixed; enough plaster is then cut away to allow motion at the knee, thus preventing the stiffness at the joint sometimes noted. Casts are changed when the surgeon deems it necessary; usually the sound leg is allowed to remain out of the cast at the end of three months.

Abduction is maintained with internal rotation and extension until union is firm. A walking caliper is useful during the first ambulatory months, and should be so applied as to take weight off the femur and put it on the ischium. During treatment, foot drop should be prevented by keeping the foot at right angles to the tibia; if a cast is used, the heel should be well padded to prevent pressure sores, or a window should be left over it for observation. The head of the fibula also requires padding, as at this point there is danger of prolonged pressure causing peroneal nerve paralysis.

The time required for fixation is, I believe, uncertain, and must be left to the judgment of the surgeon. However, from two to four months for children, and from five to seven months for adults, may be required in order to obtain a satisfactory result. Recumbency is not necessary during the entire period. The patient should use the Thomas walking caliper splint as soon as, in the judgment of the surgeon, he is fit to walk, and union is firm.

Fractures through the trochanters respond to traction well, and with the use of the Thomas splint, excellent results are obtained. The limb should usually be placed in a position of abduction, and sufficient traction maintained to secure equal length. The degree of union, which is usually rapid, is best judged by the aid of roentgenograms. The walking caliper, fitted so as to take off weight in the ambulatory stage, is excellent. Traction is obtained by adhesive plaster, Sinclair glue, the ice tong, or the Steinman pin. I believe the ice tong to be preferable, as it allows motion of the knee and traction without pain, and does not irritate the skin (Fig. 3). Transtrochanteric fractures may lead to formidable complications unless pulled down to accurate position; malunion requires osteotomy and reapplication of traction.

Fracture of the greater trochanter or separation of its epiphysis is uncommon, and may usually be treated by fixation in abduction with a firm pad over the site of fracture. When marked displacement is apparent following fixation, open operation may be resorted to. The lesser trochanter is rarely fractured, unless as a complication of comminuted fractures, when the treatment is directed toward the injury of the shaft.

Fractures of the femoral shaft.—These are usually transverse, the upper fragment being carried forward and outward with slight external rotation. Traction in the axis of the upper fragment is usual.

ly sufficient to overcome shortening, and will reduce the fracture unless interposition of muscle has occurred. It is better to reduce the fracture and apply the apparatus under anesthesia, as this gives the surgeon an opportunity to manipulate thoroughly, to stretch muscles, and to apply traction painlessly. Temporary traction to prevent shock

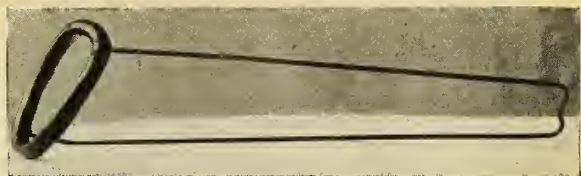


Fig. 4. Thomas extension splint.

or further damage to soft tissues is indicated during transportation. The Thomas splint should be carried in all ambulances and be available in hospitals for emergency purposes. The temporary traction is readily applied in emergency practice with the Thomas extension splint (Fig. 4). Such care lowered the mortality in cases of compound comminuted fractures during the war, and saved thousands of useful limbs. There is no question as to the value of the Thomas splint in emergency fractures, especially the compound comminuted; it has supplanted lateral splints, plaster-of-Paris, box splints, and so forth, in most of the clinics in this country. The surgeon in private practice has sometimes found the extension traction treatment extremely difficult, as constant care and supervision are required to maintain reduction and prevent relatives and friends from interfering with apparatus. Even in hospital practice, team work is required in order to secure and maintain reduction, and, as a result, special clinics for the treatment of fractures have been formed in various institutions with an especially trained personnel. Such grouping will no doubt result in a more or less standardized treatment in hospitals, and in the better care of the patient.

Simple traction or manipulation may not properly reduce the fracture. I have observed equal length with muscle between the fragments, and, in spite of careful manipulation, found it necessary to operate when it could be demonstrated that muscle and periosteum were interposed. Muscle is not always removed from between the fragments with traction. Further, muscle intervention delays union and may produce malunion or non-union. Kidner and Lakoff have reported six cases of muscle interposition, and believe that crushing and twisting are the principal causes. We operate for open reduction when, after reasonable effort, the roentgen rays show unsatisfactory position, and the time since fracture has been short. Such operations should be performed before organization of the clot or callous formation.

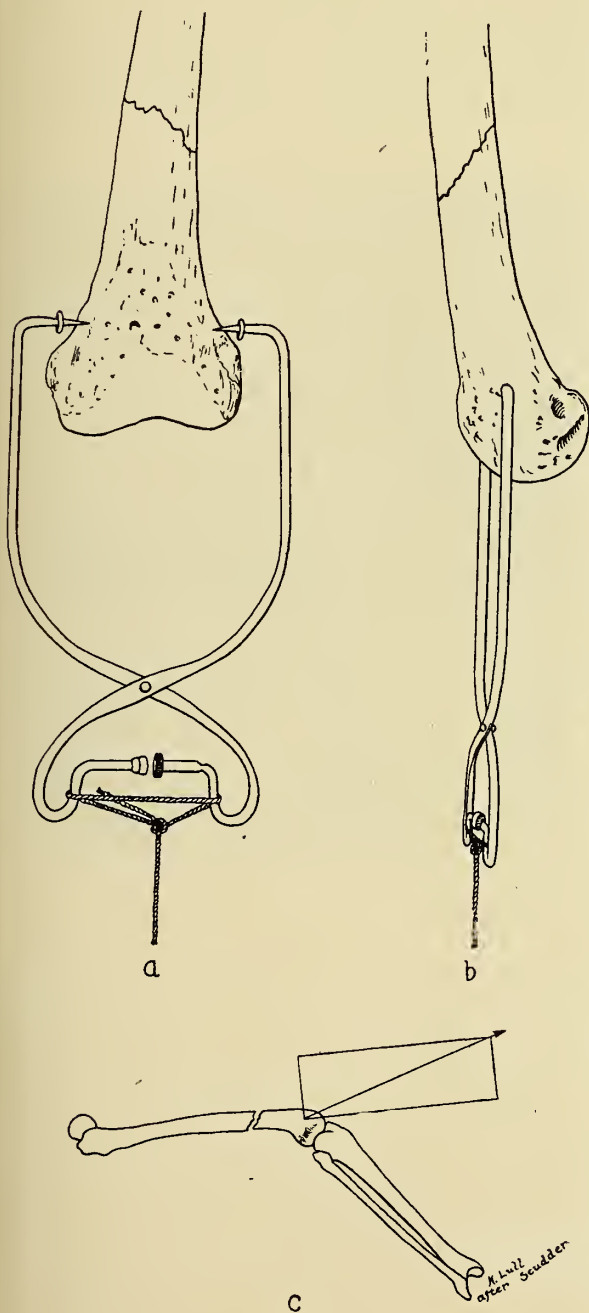


Fig. 3. (a) Ice tongs traction applied. Anterior view. (b) Lateral view showing ice tong slightly anterior to the axis of the femur, so as to pull the upper end of the lower fragment anteriorly. (c) Result of force applied in fracture of lower shaft of femur.

Although the Thomas splint has, to a large extent, supplanted the lateral splint, plaster-of-Paris, and Buck's extension, we nevertheless continue to use them occasionally. In children, fractures of the shaft are successfully treated by the Bryant suspension, as has been shown by Burdick and Siris. Fixation in plaster after reduction was formerly considered an excellent method, and will continue to be used by many. Care should be taken whenever windows are left in casts for observation of wounds, that bowing or rotation does not take place.

should be avoided. We have used an oblong block of $\frac{3}{8}$ -inch wood, wide enough to keep the adhesive off the malleoli, and prefer two or three thicknesses of adhesive and a carefully applied boot of adhesive, open in front, rather than two or three strips applied about the leg. We use Buck's extension frequently. We have also used Sinclair's glue and find it excellent in its adhesive qualities, but, like paint, it is messy and slow. Ice-tong traction, combined with the Thomas splint, is no doubt most efficient, and less apt to carry infection into the cancellous bone than the Steinman pin. The Wil-



Fig. 5 (Case 1). (a) Fracture of the neck of the femur. (b) After reduction, showing anatomic reposition. In (b) the roentgenogram was taken through plaster-of-Paris cast.

Traction may be obtained by means of adhesive plaster or moleskin, Sinclair glue, plaster cast, Hodgen's splint and pressure against the calf, ice tongs, Steinman pin, or the Finochetto stirrup. In most instances skin traction may well be extended beyond the site of fracture, as skin is elastic and gives readily; this is especially true when anesthesia is given, and reduction and traction made before the extension apparatus is applied. The skin should be prepared by shaving and washing to remove hair and grease, and the adhesive changed occasionally to prevent irritation.

Care should be taken when adhesive extends over the peroneal nerve, and pressure over the malleoli

cox universal splint deserves consideration, as it is applicable to the arm as well as to the leg. A properly fitted ring will, however, be found of greater comfort. As I have already stated, we have had difficulty in obtaining reduction by traction alone, and prefer anesthesia and manipulation, using the traction to maintain reduction. The amount of traction may be reduced after a few days; otherwise, overlength may result. In spiral fractures, even after equal length has been obtained, the bone often remains separated one-half to three-fourths of an inch. Further traction may even lengthen the leg without coaptation. When flannel supports or aluminum strips beneath the

fracture site fail, we apply a sliding ring to the splint and, by means of plates screwed against the thigh, force the fragments from any angle into position. Flannel bands may similarly be applied and run over a pulley with weights sufficient to cause correction. When applying the Sinclair modification of the Thomas splint, care should be taken to support the knee properly, to keep the foot and ankles at right angles, and to have the joint of the splint directly over the middle of the knee joint. One of the principal difficulties in the care of fractures of the shaft is backward bowing, and sufficient support behind the site of fracture, either by flannel bands, aluminum bands, or overhead traction, is essential.

Fractures of the lower shaft and condyles.—In fractures of the lower shaft and condyles, the upper end of the lower fragment is practically always displaced backward, the sharp edge of the fracture resting on the nerves and blood vessels. Anesthesia is essential in reduction, to relieve muscle spasm. Pressure is to be avoided over the fractured ends, lest more injury to soft parts be produced. Gradual traction, with the knee partly flexed, and the assistant bearing down on the shaft above the fracture while the surgeon forces upward with his hand under the condyles, will usually accomplish reduction. Certain spiral or slanting fractures may force the lower fragment upward and to the side; in such cases, traction is essential, with knee flexion. However, should difficulty be encountered, and reduction be unsuccessful, open operation is indicated. Reduction is perhaps best maintained by the use of a double inclined plane, either as half cast, wooden wedge, modified Hodgen splint, or Sinclair modification of Thomas splint; the latter is perhaps the best. The great advantage in using the ice tongs or Steinman pin in fractures in the lower femur lies in the avoidance of stiffness in the knee. Charbonnier has obtained satisfactory reduction with the Steinman pin in 85 per cent of his cases, with no serious after results, union taking place in from twenty-five to fifty days, and Dennis Crile reports 300 cases reduced without difficulty. The insertion of these appliances in fractures of the lower shaft should be anterior to the middle axis of the femur, so as to pull the upper end of the lower fragment forward.

Anterior displacement of the lower epiphysis.—Reduction in these cases is difficult, and should not be attempted without anesthesia. After the patient

is thoroughly relaxed, traction is made with the knee slightly flexed by the assistant, while the surgeon grasps the leg with both hands just above the epiphyseal line, and with thumbs on either side forces the epiphysis downward over the end of the femur. The leg is then put up in right angle flexion and maintained in this position for several weeks, after which gentle motion is begun. Should it be impossible to manipulate the epiphysis into position, I have no hesitation in opening through a lateral incision to reduce the fracture, and I secure fixation in anatomical reposition by means of beef-bone screws.

Intra-articular fractures.—Unless intra-articular fractures are perfectly reduced, they lead to permanent partial disability, and therefore the use of conservative splints, casts, and so forth is, we believe, fast losing ground in favor of open reduction and internal fixation.

Compound fractures.—Our method of caring for compound fractures may be summarized as follows:

With a sterile gauze pack, saturated in Dakin's solution or iodine, over the wound, the surrounding skin is shaved and cleansed. The protruding bone and tissue is thoroughly washed with a large quantity of Dakin's or a solution of iodine. The soiled tissue and small fragments of bone are excised.

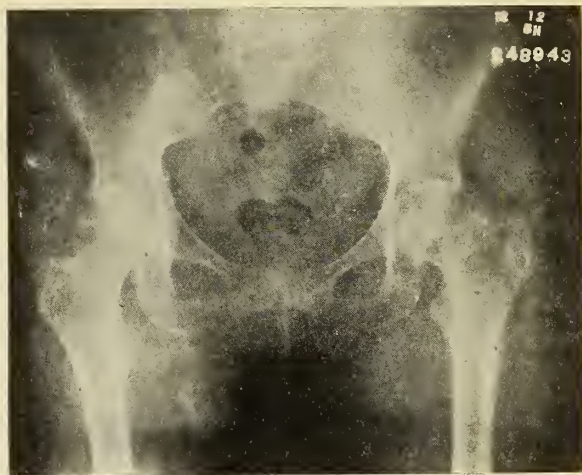


Fig. 6 (Case 2). Result eleven months after fracture of the hip. Good function.

The fracture is then immediately reduced, under anesthesia, and suitable apparatus applied. If the wound has been extensively soiled and the surgeon does not believe he obtained a clean wound by the foregoing measures, the wound is Dakinized and

packed for forty-eight hours. The wound is then allowed to close of itself, or is loosely sutured and left alone. Fifteen hundred units of anti-tetanic serum is given. Intra-articular wounds are not Dakinized. Iodin may be used instead of Dakin's solution to cleanse or wash the wound before and after débridement.

REPORT OF CASES

Case 1. Mrs. C. A., aged seventy years, fell on an icy sidewalk in February, 1922, fracturing the right hip. The characteristic eversion, shortening, and so forth, were present. A roentgen-ray revealed fracture of the neck with upward displacement.

The patient was anesthetized and Whitman manipulation performed; a cast was applied extending to the knee on the sound side and to the toes on the fractured side. Windows were left over the abdomen and patella. Part of the cast around the knee was removed, side hinges were inserted, and knee motion begun at the end of eight weeks. The patient, being old and feeble, was permitted to be moved about in a wheel chair. At the end of the third month of treatment, all apparatus was discarded because of the patient's general health; the legs were of equal length, and as union was apparently firm, she was encouraged to walk with crutches. At the end of six months, she was dismissed as cured, walking.

Comment.—Treatment was abandoned at the end of the third month, yet a perfect result was obtained in six months. This case illustrates the occasional necessity of treating the patient first and the fracture second (Fig. 5).

Case 2. Mrs. M. C., aged fifty-one years, fell and injured her left hip January 19, 1921. A roentgen ray revealed fracture of the neck of the femur. There was eversion and three-fourths of an inch shortening. Extension with internal rotation was applied until abdominal distention, nausea, leukocytosis and complicating symptoms cleared up. January 28 the fracture was reduced by the Whitman method, and a cast applied. The cast was changed April 27 and May 18. September 21 union was firm and the patient was walking with a cane. She has made excellent recovery with one-half inch shortening.

Comment.—The patient sustained several falls during convalescence, following which knee motion was improved. A cast was not applied and the patient was not subjected to anesthesia until I was convinced that her general condition was satisfactory. The roentgen-ray shows the result after eleven months (Fig. 6).

Case 3. A plasterer, aged forty years, fell eight feet, and struck on his right hip. He was brought into the hospital at once. Examination showed outward rotation of the right leg without shortening, pain in the hip, and inability to raise the leg from the bed. Roentgenograms revealed an impacted fracture in excellent position. With equal length and excellent position, there seemed to be no indication for breaking up the impaction. Treatment consisted of traction with a Thomas splint.

The patient left the hospital the second week, to continue treatment at home. He was observed from time to time,

and roentgenograms were made. At the end of nine weeks he was up and about, walking on crutches with the aid of a caliper splint. At the end of one year, union was perfect, and the position correct, with equal length, good motion in the joint, and no atrophy.

Comment.—This case is cited to show that, although the Whitman method is a practical standard, and we are suspicious of every impacted fracture of the hip joint, many of which require manipulation, yet there are exceptions to the rule. The ultimate result is shown in Figure 7.



Fig. 7 (Case 3). Roentgenogram showing impacted fracture of neck of femur.

Case 4. A boy, aged six years, fell off a wagon into the spokes of a wheel. A roentgenogram, anterior view only, was taken by his physician, and no fracture found. A splint was applied for two weeks, and the patient then advised to walk.

At examination, during the fifth week, the left knee was swollen and tender, with anterior displacement of the epiphysis. The malunion was broken up through a lateral incision and the epiphyseal separation reduced. Within six months 90 degrees motion resulted.

Comment.—This case illustrates the advisability of always taking anterior and lateral roentgenograms (Fig. 8).

Case 5. A farmer, aged forty-two years, was brought about fifty miles by automobile to the Clinic by his family physician. He had sustained compound comminuted fractures of the left tibia and fibula with dislocation of the ankle joint and multiple lacerations of the legs. The right femur was fractured at the juncture of the lower and middle thirds. The accident occurred in the morning, and he arrived at the Clinic in the evening, dressings and splints having already been applied.

Roentgenograms were taken immediately, anti-tetanic serum was given, and the patient was prepared for operation on the left leg. Through two lateral incisions, the fractures of the tibia and fibula, and the dislocation were reduced, and held by a nail and Parham-Martin band; the

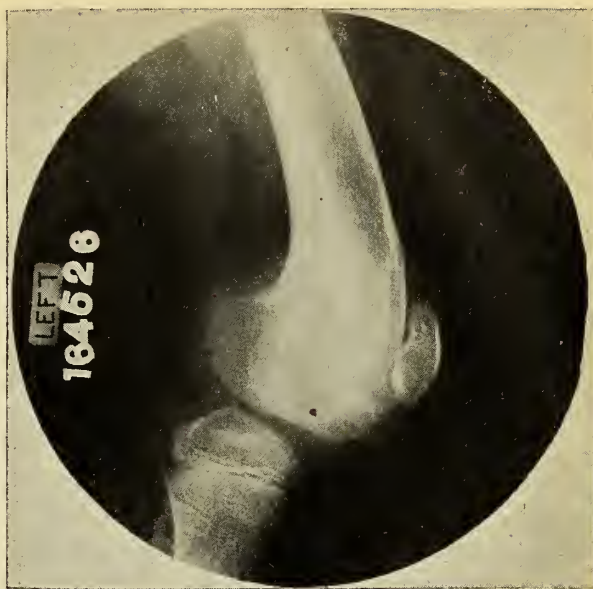
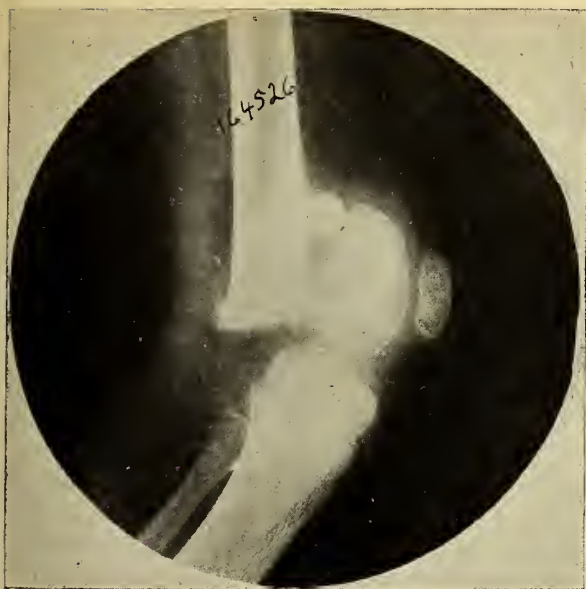


Fig. 8 (Case 4). (a) Lateral view showing lower epiphyseal separation of femur. (b) Result, one year after reduction. Note anterior bowing of femur as a result of damage to epiphysis.

fractured femur was placed in a plaster-of-Paris cast with the knee slightly flexed. Eight pounds of extension was applied to the suspended right leg through the cast. There was no infection. A month later a Sinclair modification of the Thomas splint was applied and active knee motion begun, and continued until the seventh week. The patient then returned home with the cast split into anterior and posterior halves, having been advised to remain off his feet.

The patient returned seven weeks later, having walked on both legs. The right femur remained firmly united in spite of bearing most of his weight. The left tibia bowed out-

ward. The patient was operated on and the Parham band and nail were removed. The tibia and fibula were manipulated into position and a cast was applied. The patient went home the fourth week under the home physician's observation.

Comment.—Surgery of the left leg was indicated, and amputation was considered. However, infection did not result in spite of the crushing and soiled comminuted fractures with dislocation. Conservative treatment of the left femur resulted in early function and good knee motion (Fig. 9).

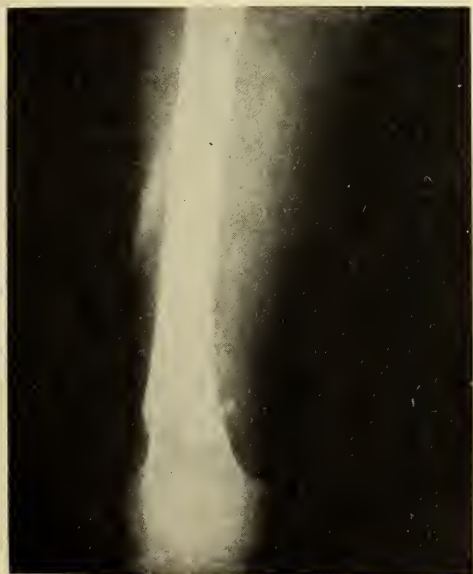


Fig. 9 (Case 5). Result of conservative, non-operative treatment of fracture in lower third of femur. Anterior and lateral views.

SUMMARY AND CONCLUSIONS

In the conservative treatment of fractures of the femur, after the patient's general condition has been considered, and roentgenograms taken, immediate reduction should be undertaken, and anatomic reposition obtained, if possible, and maintained by suitable apparatus, to prevent stiffness of joints, useless atrophy, pressure sores, and so forth. To correct deformity properly, and maintain reduction, the anatomy must always be carefully considered. Anatomic reposition is, of course, the desired end, but good function may be obtained without perfect reduction. The patient's temporary comfort should not be allowed to interfere with the ultimate result, for although the force required to overcome muscle pull in adults often makes traction uncomfortable, inefficient traction and comfort lead to improper reduction and failure.

There is no rule as to when union will occur, but the roentgen ray and clinical findings are helpful guides. Anterior and lateral roentgenograms, before and immediately after reduction, are advisable. Further roentgenograms may be taken at the discretion of the surgeon, but should always be taken at the time of dismissal. The history should be continued throughout treatment, and a careful record of measurements kept.

In cases of fracture below the femoral neck, traction by means of the Thomas splint or its modifications (Fig. 10), such as Sinclair's, is the most efficient conservative treatment. The amount of traction will, of course, vary with the patient. The means of obtaining traction may be skeletal or from the skin; the former is the more efficient. The use of the Thomas traction splint in emergency treatment is of unquestionable value.

Compound fracture should receive immediate cleansing and débridement, and antitetanic serum should be administered to the patient.

Physiotherapy is a valuable aid in the treatment, and in uncomplicated cases, and with the use of a caliper splint or Steinman pin, may be carried on throughout convalescence. If the Thomas splint is used, the skin near the ring should be massaged daily, and soothed with alcohol or talcum. Considerably less atrophy results if daily massage is employed, and as a result of the improved circulation, the time required to obtain firm union is often shortened. The physiotherapist may also help to prevent pressure sores by massaging over the sacrum, even in the presence of a cast. Motion

of joints and gentle massage under supervision also obviate stiffness; this is especially true in cases of old arthritis.

Conservative treatment is more adaptable to children than to adults, for in children slight deformities tend to correct themselves, and joint complaints are rare. However, epiphyseal separation and injury are more common, and may lead to subsequent deformity. Adults require more protracted care than children, and are more difficult to confine. There is less tendency to correction of deformity following union, and greater tendency to static joint complaints. Open operation is, therefore, more often resorted to, except in fractures of the hip, in which treatment by Whitman's method usually gives accurate reduction and retention. In most cases, when a reasonable attempt at conservative treatment fails to provide satisfactory reduction within five or seven days, open reduction is advisable if suitable operating facilities are available.

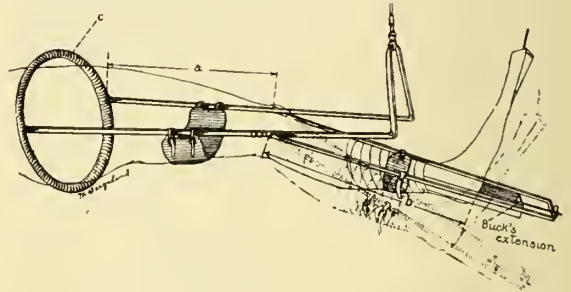


Fig. 10. Modified Thomas splint to allow knee motion.

Our experience at the Clinic has led to the following conclusions:

1. The Whitman treatment of recent fractures of the head and neck is efficient, and open operation is unnecessary.
2. In the recent fractures of the shaft, the non-operative treatment has apparently given more satisfactory results, although a comparison of these cases with those in which operation was performed is unjust, since open reduction was performed in only the more difficult cases. Anesthesia, manipulation and retention by extension with Thomas splints, has been the method of choice in simple fractures. In twenty-seven of twenty-nine simple fractures treated conservatively, the results were satisfactory.
3. Excellent results are obtained in supracondylar or condylar fractures in the lower shaft, by

flexion of the knee and extension. When the Steinman pin or ice tongs are used, they should be accurately placed anterior to the axis of the femur.

4. Unless practically anatomic reposition is obtained in the intra-articular fractures by conservative treatment, arthrotomy and internal fixation is indicated.

5. When, after reasonable attempts, conservative treatment has failed to give satisfactory reduction, open operation, reduction, and fixation is advisable.

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THE OPERATIVE TREATMENT OF FRACTURES OF THE FEMUR*

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If the results obtained in femoral fractures were entirely satisfactory there would not be much point to this symposium. Speed, Eliason, Carroll, Kidner and others have recently published reports of the results obtained in the larger clinics that are worthy of careful study. Eliason describes the routine treatment in the University of Pennsylvania Hospital, which consists of first applying extension and placing the fragments in as good position as possible without the aid of an anesthetic. They are left in this position about three days and then radiographed. In eighty-eight cases so treated, all were found to be in bad position when radiographed. Yet it will be admitted that this simple extension treatment of fractures of the femoral shaft has been depended upon until recently to replace the fragments in their proper position and hold them there. It has been assumed that if a surgeon applied a Buck's extension of say twenty pounds he could not be blamed for any bad result that might accidentally occur. Statistics show a percentage of permanent disability in these fractures, even in the best hospital practice, that ought to fill us with discontent. The bad results are not found in the closed cases alone. Open methods have their full share. Indeed, there has been a reaction against the epidemic of open operations of a few years ago, particularly against the indiscriminate use of the steel plate.

The profession is awaking to the fact that the treatment of fractures has not made the advances of other branches of surgery. One of the reasons for this may be the lack of specialization in this field. Usually the nearest doctor is called and few cases are referred. In the case of thigh fractures, transportation was not only painful but positively dangerous until the Thomas splint came into general use. As a result of everybody treating these cases, few surgeons see enough of any one type to work out comparative results and add much to our scientific knowledge. The current literature on fractures is overwhelming. Differences of opinion are greater than in any other branch of surgery.

*Presented in symposium before the annual meeting of the Minnesota State Medical Association, Saint Paul, October, 1923.

The equipment proposed would fill an instrument shop. The crying need is for simplification of both method and equipment. Until some of the methods have been perfected and others proved inadequate and discarded, standardization can hardly be hoped for. Still the aim of this paper is to offer some suggestions along this line.

The indications for operative treatment are sometimes difficult and at other times obvious. Examples of the latter are compound fractures, true cases of non-union and cases in which there is interposition of soft parts. Open replacement alone offers hopes of a good result in these cases. In oblique fractures traction can almost always be depended upon to give at least a fair result provided the soft parts are not interposed. It is in the case of transverse fracture that decision is most difficult. If repeated manipulations under an anesthetic have been tried and the limb put up in traction with the distal fragment in line with the proximal fragment, still shows displacement, shall an attempt at open operation be tried?

A committee appointed by the British Medical Society to report on the ultimate results obtained in the treatment of simple fractures, with and without operation, presented some interesting conclusions. They are too long to quote in full, but in brief they found the results in children good by the closed method but poor in the case of adults. They stated that "although the functional result may be good with an indifferent anatomical one, the most certain way to obtain a good functional result is to secure a good anatomic one."

In deciding upon operation other factors than the fracture itself must be considered. Of these the age and health of the patient and the skill and equipment of the surgeon are most important. Under equipment are included not only suitable bone instruments but a good hospital, trained assistants, a bedside x-ray outfit and a traction operating table. If operation is indicated so far as all these factors are concerned, the problem must then be put up to the patient himself. He must be made aware of the dangers of the operation while at the same time the probable interference with function and greater possibility of non-union if not operated must be pointed out. It must not be overlooked that repeated manipulations may do more damage to the tissues than open operation.

Due to our war experience many cases can now be handled by the closed method that formerly

would have required open operation. Still we must not expect to exactly copy the results obtained in gunshot wounds. General Bowlby, of the British Army, has called attention to the much greater difficulty in getting full extension in civil fractures than in the lacerated thighs seen in the base hospitals. At the same time bone surgery has made great advances and the dangers of operation have been reduced. Better function is now expected and certain cases must be operated that were formerly allowed to unite in a faulty position.

The multiplicity of methods and appliances for holding the ends in apposition is proof in itself that no one method is entirely satisfactory although many are ingenious and produce good results in the hands of the originators. Only the simplest and most used methods will be mentioned. Some of these attempt not only to hold the ends in apposition but at the same time to actually splint, that is, to prevent angulation by internal means. The steel plate does this most efficiently from a mechanical standpoint and is about the simplest internal splint to introduce. Unfortunately the steel plate has the serious defect of causing irritation and interfering with union. Infections are frequent and the plate must often be removed. The beef bone plate with the threaded beef bone screw is somewhat more difficult of application, more bulky and not as strong but is much less irritating and in most cases is eventually absorbed. The autogenous inlay graft is still less efficient mechanically but has the great advantage that it is non-irritating and is actually stimulating to bone repair. In the case of ununited fractures it is often indispensable. It is usually not a justifiable procedure in a fresh thigh fracture because of its difficulty of application and the extensive dissection required in a thigh to expose a sufficient field through a thick mass of muscles. Unless a sliding graft is used it also necessitates a second incision to remove the graft from the tibia. It has been found that it is not safe to depend upon the splinting effect even of the long steel plate as the powerful thigh muscles will finally produce angulation with loosening of the screws.

The principal methods of end to end approximation are by the short bone or ivory plate, the intermedullary graft and suture. The Magnuson ivory plate method is very efficient mechanically. It consists of a thin ivory plate which is fitted into a keyway cut edgewise in the ends of the bones. It is held in place by special threaded ivory bolts

screwed in at right angles to the plate through the entire shaft. The method requires special plates and instruments. The intramedullary graft is simple but is physiologically wrong as the periosteum and endosteum must be removed from the graft and the medullary cavity cleaned out at the very point where it should be preserved. Also it is difficult after the graft has been introduced into one end to separate the fragments enough so it can be introduced into the other. This has been accomplished in various ways. The graft has been introduced full length into one end and the fracture reduced. The ends are then pried apart enough so that the graft can be teased back into the other. Another method is the so-called "submarine" graft. A short graft is cut similar to the familiar sliding inlay graft but the incision is not carried down within an inch of the end of the fragment. This is sunk into the medullary cavity and driven endwise into the other fragment. The intermedullary graft has many advocates in fresh fractures and is a method that must be seriously considered because of its simplicity and efficiency.

The mechanical efficiency of simple suture depends to a large extent on the material used and the method employed. Wire is not only a foreign body which is irritating but is difficult to fasten and is apt to kink and break. Soldering the joint, which has recently been suggested, would not help. Of all materials proposed to date, Kangaroo tendon seems to come nearest to meeting the demands. It is remarkably tough and but slightly irritating and, while it is absorbable, it lasts until bone union begins.

Having decided in a given case that open operation is necessary, proceed to get the fragments in place and hold them there in the simplest method possible and yet with a well worked out plan and ready for any contingency. As a rule traction straps should be applied from knee to ankle before operation. The entire thigh should be scrubbed up the day previously and an alcohol pack applied. The operation should be performed on a traction table of the Hawley type. The proper draping of the patient is of great importance in carrying out a clean technique. The leg must be draped so that the various manipulations do not expose unsterile fields. For this purpose the leg below the knee should be wrapped in snug fitting drapes held in place with a sterile bandage and then placed above the sterile sheet. Jones wraps the operative field in

sterile muslin and makes the incision through this. The incision in a shaft fracture will usually be on the outer anterior aspect. Start with a short incision in a transverse fracture as this may be all that is necessary. When the ends are reached remove clots and attempt to pry the fragments into position. In many cases the ends can be locked together and the limb put up without any internal fixation. If they tend to slip they must be fastened. Kangaroo tendon will hold in most cases, if properly applied. The much used method of drilling through the entire shaft from side to side, perhaps an inch from the ends and passing a single strand of wire or other suture through these holes is absolutely futile. The sutures must be introduced so as to prevent lateral movement. After the ends are in good apposition drill holes in pairs close to the fracture line and extending through the cortex only. There should be two pairs of holes placed at least 90 degrees apart on the circumference. When these holes are drilled, relax the extension and allow the ends to angulate out into the wound. It is usually difficult to lace the kangaroo tendon through these holes with a stiff needle. An improvised suture carrier made of a loop of piano wire (heavy tonsil snare wire) firmly set in a hemostat greatly expedites this step. This carrier can be bent into any desired shape and easily slipped through the sharp walled holes either from within or without and the tendon threaded into it and pulled through. Long strands should be used and these should be laced through two or three times. This is important as twice through more than doubles the strength since the knot is the weakest point of any ligature. Once more bring the ends into apposition and draw the sutures just snug and tie. Experiments by the writer have shown the efficiency of sutures so applied. A transverse fracture fastened with three strands of heavy tendon withstood an angulating strain of over twenty pounds applied six inches from the fracture.

Opinions differ as to temporary drainage. Eliason reports that all cases of nonunion or delayed union occurred in his undrained cases. Others have had similar experiences and most operators put in a few strands of silkworm gut.

The strength of simple suture properly applied has been underestimated. If the operator does not feel that it is strong enough in any particular case, it would be best to resort to the steel plate for the transverse fracture and the Parham band for the

nately, for some reason or other, angulation has occurred, then I think it can be corrected.

Now this man here is a big, strong, muscular fellow. I have him here and I will have him walk in so you can see what his result is. This result will be what you see here anatomically, and the functional result will be what you see when you see him walk across the room. This man was not treated by me at first. For the last three or four years the resident at the hospital has been treating fractures of the femur, and he treated them under a good deal of difficulty, and he did very well, as you will see from some of these results. But every once in a while I would be called upon to see a man and I would find that his measurements were not very good; and I thought he was not going to have a good result, and then we would do something else. This is the position after he had been treated for three or four weeks. He was given an anesthetic and this position corrected some, as you see, pulled down a good deal more, and a good deal of weight put on; and this is the result.

Now it is a bad looking mess. Very early in the x-ray work I was associated with the late Dr. Wheaton, and I used to enthusiastically show him some x-ray pictures of fractures, and he would say, "Throw out your old x-ray pictures and show me the patient. I want to see the patient." So on two or three occasions where I was inclined to get anatomical perfection he would say, "That is good enough. You have a straight limb." I tried to correct it two or three times with his sanction, and I never improved it very much; but the patient got a good result. Later on, I might say, he became convinced of the value of x-ray pictures and said, "I don't see how I ever practiced surgery without them."

Just as in gross and histological pathology, we come to have a combined experience of clinical and radiographic evidence; and if we do not use both of those evidences, the clinical and the radiographic together, and take the sum of the result, we are going to get into trouble.

I might say—with whatever criticism it may bring—that I have never operated on a fracture of the femur. I have operated on some other fractures where the indications were quite apparent; but I have not operated on a fracture of the femur; and there is only one that I can think of where I wish I had.

This man here had a fracture of both femurs. He was a very obstreperous, sensitive fellow, and we had a great deal of difficulty in treating him. Now just as in that man in the picture I showed before, so in this man at the end of two or three weeks I anesthetized him, pulled it down and improved the position; and this slide shows what we finally got. We did not have any way of checking up the measurements because both were fractured. There is a difference of a little less than a centimeter between the two femurs, and he walks without any limp and perfectly well.

This woman was treated by the resident doctor, and I saw her repeatedly with him and was very much interested in the case. These are pictures taken at various times, showing the position of the fracture, and these are the final results. There is nothing more to say about that except that she was treated in this same traction. We will

have her walk in. (Woman walks across the stage.) This woman has been out of the hospital some four or five months. The first man has been out about six or eight months.

This is rather a remarkable series of pictures. That boy came in with a diagnosis of fracture of the femur, and there was something at once that was peculiar about it; I mean he gave a history of having had some disability and they thought his leg was broken before; and now he had broken it over again. So we took these pictures. This was the first picture. Now, of course, this shadow here and the rather porous condition of the bone and this sort of indefinite shadow out here attracted our attention at once, and we wondered. We put him on the same kind of traction that we have here, and this is the picture a little later, showing a great big arc of bone showing out here on each side, with the shaft of the femur in the center. This is a later picture, showing this bone having increased in density, and this shaft here acting as if it some time might be a sequestrum. In other words, the boy had a chronic osteomyelitis that he had been walking around with and paying no attention to until he fell and broke it, and then they put him to bed for a week or ten days; and as soon as the soreness got out of his leg he got up and walked around and broke it again; and this is the result here.

The interesting thing about this boy further was that after he had been in the hospital under treatment for about a month with traction, he suddenly developed a swollen elbow and had a good deal of pain and a good deal of fever. I will have the boy walk across the room so you can see him. (Boy walks across the stage.) He has been out of the hospital now for two or three months, and he is walking on that kind of femur; that is, he has osteomyelitis. He hadn't any elevation of temperature until the complication of the elbow arose. After this elevation of temperature and swollen elbow had existed for a week or so, I decided that he had an osteomyelitis at the lower end of the humerus, and simply incised the abscess down to the bone and drained it.

The extraordinary thing about this femur is that he has osteomyelitis. He has had it for many months. He had a fracture and it has united; there has been enough plastic material thrown out. You see it has never discharged; it hasn't any opening. The bone is not very tender; his thigh is perfectly straight. You can see that osteomyelitis at the lower end of the humerus with simple drainage, without any attack on the bone at all, has been cured. This young bone has acted very much like soft parts and has drained itself, and the elbow is apparently perfect. The bone, of course, is the most prolific tissue in the body. I think the osteoblasts do more for repair than any of the other tissues we have. The repair of children's fractures is unusually rapid. The amount of new bone thrown out—it is thrown out very quickly—the bone, by virtue of the static demands and the growing under those static demands, acquires its shape, even if there is primary deformity. If there is not too much angulation they will in time correct that, not only in the femur and tibia, but in the arm bones as well. I have watched them for years—some of them where there was a very great deal of displacement—and they are corrected.

It seems to me that these pictures show pretty positively that operative treatment in fractures of the femur is rarely called for. That first man was a great big strong fellow, and so was the man in the pictures of the second case you saw that were treated by this simple method of traction. The traction is continuous, and the limb is in such a position that you can inspect it at any time you want to. It must be measured frequently. If that is done I have come to think that fracture of the femur, in the shaft at least—and Dr. Meyerding and Dr. Cole and Dr. Reed have all emphasized the value of the abduction treatment in fractures of the neck—I think it is pretty unanimously agreed that this is the treatment for most cases. It seems to me that the cases that have to be operated on are very rare, indeed.

Now, just one minute about the hospitalization. This very valuable article of Dr. Speed's to which I referred, says that fractures of the femur are all subject to hospitalization and they should be treated in the hospital and they should be treated by radiography control. Well, that is very fine, and it is the most desirable thing to do. I feel that the radiograph in its connection with fractures is one of the most valuable things we have in the sense of studying fractures, just as the microscope is a very valuable thing to study tumors. After you have studied them for a long time, you get to know them. So with the study of fractures with the radiograph. The combined radiograph and clinical study—and the clinical study must not let up one minute during the time that you are interested in the radiograph, because if you do you will get into trouble. But with that combined study it is fine.

I believe, however, that in most fractures of the femur, and I think it should be recognized as true, because a very large number of fractures have to be treated in the country; they are not near a hospital, it is difficult to move them—I think they can be treated perfectly well if they are treated with the very simple arrangements which we use with the Thomas splint, which makes it impossible for the traction to let up, and if instead of using the radiographic control you will use the clinical control to watch your apparatus and make the measurements every few days, I think you are bound to get a pretty good result.

DR. A. E. WILCOX, Minneapolis: These very interesting papers heard this morning emphasize the importance of, and are evidence that, we are beginning to appreciate that the treatment of fractures is a difficult department of surgery.

While I was listening to Dr. Colvin, I was reminded of a case which we are now observing. The patient is suffering from a fracture of both thighs, simple in type, and, although she is in a hospital where available equipment is efficient, in fact, apparatus which I am particularly partial to and think I know how to apply, we are having a great many difficulties. We are experiencing a problem, the solving of which necessitates the management of a delirious patient, resulting from fracture of the skull, complicating the fractured thighs. We are having local abscess from broken down hematomas of the soft structures, and all the while we are trying to keep proper extension on the thighs by caliper skeletal traction. It is not difficult to visualize the problem, or to appreciate the problem.

In the treatment of fractures there are three fundamental

principles which have been emphasized in all the papers read today. They are: First, selection of the type of treatment, according to the type of case, age of patient, etc.; second, the general principle of extension and counter extension, and third, forms and methods of mechanical apparatus for holding reduced fragments in place after reduction has been attained. By keeping these fundamental principles in mind we stand a good chance of obtaining the result desired, namely, a good functional result, and if not an entirely satisfactory result an anatomical one.

The subject of the treatment of fractures of the thigh could be discussed indefinitely. I, therefore, prefer at this time to adhere to a discussion of the three fundamental principles mentioned.

In the General Hospital, Minneapolis, upon admission of a fracture case, we attempt to classify same, operative or non-operative. We consider skeletal traction, in any form, operative, and so classify such cases for the reason that the procedure must be carried out under the same conditions and with the same technique as that exhibited in more formal procedures. After classification, and the treatment selected, the next thought is extension and counter-extension. In fact, extension is thought from the time the patient is seen by our house-officers at the scene of accident, at which time, in cases of fracture of the thigh, a Thomas splint, which is carried in the ambulance, is at once applied and the patient reaches the hospital with the leg under the influence of extension.

Following application of more refined extension and counter-extension with our standardized splints we come to an important part of the treatment. We may be very much satisfied with our efforts up to this time. Reduction is good, patient comfortable and apparatus well applied, but from this time on the importance of daily observation and adjustment of the apparatus cannot be overestimated. Calipers must be watched, the wounds kept clean, supportive toweling smooth and on the right tension, and the position of the fragments checked and rechecked repeatedly with portable x-rays.

One must have the intelligent co-operation of the house staff and considerable enthusiasm amongst the associates. In fact, the concerted effort of every one coming in contact with such cases is necessary to obtain the best results. Without this co-operation, unless one has the time to do all adjustment themselves, you are going to find, sooner or later, that deformity has occurred, just as Dr. Colvin has stated, which may require repeated anesthesia and correction. Therefore, I think the post-traumatic period, after classification, reduction and fixation, is a very important period as regards treatment. Observation during this period must be most conscientious, diligent and continuous, for even where there is internal fixation by steel plate application, the strong muscles are everlastingly contracting and produce secondary deformity unless continuous extension is applied long enough to attain callus formation.

Another point in all fractures of the thigh is the question of when to allow weight bearing. Assuming good alignment, good callus formation and functional joints, weight bearing must be deferred until the callus is hard. It is our custom to urge these cases to use caliper walking splints, depending upon their weight, activity and amount

of callus, for three to six months after union has occurred. I am particular to see that the patients co-operate with these suggestions and use the splint continually. Under these conditions children may soon return to school, or adults return to certain types of employment without danger of secondary deformity or bowing. One such secondary deformity in a limb which was not protected, although in perfect condition when discharged, was sufficient to teach me this lesson.

The question of treatment of thigh fracture is very important, as Dr. Meyerding says, for the responsibility of the surgeon in these cases is very great. He is responsible not only for good functional results, but patients expect good anatomical results as well.

I do not quite agree with Dr. Colvin when he states that all cases of fracture of the thigh can be treated satisfactorily by extension alone. I have a number of cases in which I am fully convinced I have obtained much better results by operating upon them than I would have had by using extension only in the treatment, and at the present time, from these experiences, I am satisfied that operation in selected cases at times is clearly indicated.

Another thing—our responsibility in court is such that the presentation of some of the x-rays such as Dr. Colvin has shown this morning, if exhibited by a less famous surgeon, would be apt to bring from a jury, even where the functional result has been so good, a large verdict. A famous man can get away with such types of cases by emphasizing the importance of functional results, but the jury, where they are allowed to view x-rays of this type, would certainly be doubtful about the efficiency of the treatment. Until we educate the people to the fact that functional results are the thing to be obtained and that frequently it is impossible to secure good anatomical alignment, as shown in x-rays, we are going to run the chances of having verdicts against us in the courts.

DR. E. K. GREEN, Minneapolis: I want to emphasize one or two points which were brought out. Dr. Wilcox, I think, has made one of the most important points here this morning and that is in regard to our being everlastingly on the job. These cases are not easy; they are major cases, and it is very necessary that they should be looked after continuously.

There is one point with regard to the matter of extension which I would like to bring out here, and that is the amount of the weight. I do not know what the experience of other surgeons has been, but I have found this to be true, that a fracture of the femur will be put up with 20 pounds weight, and the surgeon will keep it on faithfully for say three months, or less—whatever time he thinks is necessary—having never changed the weight, making it more or less, and having paid very little attention as to what it is doing. It seems to me that that is altogether wrong. When you take one of these fractures into the hospital to reduce and try to pull it out—did you ever think how much weight you put onto it? Sometimes to get it out where you want it, you put on all the strength you have and maybe get somebody else to help you. So, consequently, it seems to me that there are many times where we can put on a very much greater weight than has been suggested here this morning. I think 30 pounds is the largest that I have

heard. I would say up to 50 or 75 pounds; but when I say that, just be careful! If you do not know when is the right time to take off the weight you are going to get into more trouble than you would if you did not put it on. That is what you have to look out for. Consequently, the question of watching the patient and knowing what to do at the right time is probably the most important part of the management.

There is just one other point that I want to emphasize. It was brought out by Dr. Reed. There is no time in the operating of a fracture that I feel so scared and really do not know what to do and how to do it and do it right as the matter of getting the patient back to the room and into his bed after I have operated him. Many times you will see a doctor operate the case, and then turn it over to the internes or to inexperienced nurses. I think the doctor should stay by his case absolutely until he sees that they are properly placed in bed, especially after operations.

DR. ROBERT EARL, St. Paul: I believe one of the most common faults in treating fractures of the femur with external traction is that the adhesive is not run far enough up on the thigh. Many men think that you should not put the adhesive any higher than the fracture. Some even stop it below the knee.

In surface traction the adhesive should be applied well above the point of the fracture, as high up on the groin and hip as possible, even if the fracture is in the lower part of the femur. In a fracture the lower end will be carried down by traction, the upper end being fixed. That the soft parts can be stretched and carried down below the proximal end of the fractured bone has been demonstrated in cases of amputation of the thigh in which the bone has been cut too long so the amputated end of the femur is exposed as much as two or three inches. In these cases, surface traction will pull the soft tissues down so they will unite over the end of the protruding amputated femur, demonstrating that surface traction can elongate the soft tissues.

Surgeons with very large experience, who have used as high as 50 pounds of weight, have never seen any damage done to the knee-joint by properly applied surface traction. The application of adhesive high up on the thigh, even when the fracture is in the lower third, relieves the knee of much strain.

When an anesthetic is given, the muscles should be over-stretched so as to partly paralyze them, after which not nearly so much traction will be required to maintain the desired length. If an anesthetic is not given, maximum traction should be used at the beginning when the ligaments are firm, as there is then less danger of producing relaxed joints than if gradually increasing traction is applied after the ligaments are softened.

Maximum traction at the beginning decreases the pain and gives better alignment before the blood clot at the site of fracture becomes organized.

DR. A. E. BENJAMIN, Minneapolis: There are one or two points that I think we should emphasize. The man who treats these cases, especially the general practitioner who takes them as emergency cases, does not need to be discouraged if the first x-ray does not show the proper

position. If you wait two or three weeks when the exudation is plastic, reduction can be made and the fragments retained more readily than at the primary reduction. That has been demonstrated in some cases I have had.

In regard to the operative procedure, I have found that there are certain classes of cases in fracture of the femur where the time saved in recovery of the patient pays one to operate; that is, if it is done with proper precautions and in the hospital. I think that when bone surgery first came out we were misled a little in the operative procedure; as were some who visited Lane and saw him operate in his small operating room where he could not turn around without a possibility of touching some of the instruments or the wound. The method which he employed interested many American surgeons. If a man is careful in selecting and operating his cases in bone surgery, he will get just as good results as in a laparotomy. There isn't any question about it. The bones and all the tissues heal as a rule. If he is rough and traumatizes the tissues and does not have them well protected—as I have seen some operators do—he will infect the wound. He may have four or five assistants pulling and tugging in order to get reduction and the bone in place and the plate on. If you are very careful to supervise the work at the time, I think you will get very good results; at least I have had in nearly all of my cases that I have operated upon.

Oblique fractures—particularly where they will not stay in place; the x-ray will show each time that they have slid some; no matter how much traction you put on. Such cases particularly are applicable for operative procedure.

DR. ARNOLD SCHWYZER, St. Paul: I believe that operations on fractures of the thigh are very seldom necessary. Some of the men who have discussed this have said that there were certain cases that they want to operate on. I would like to ask all of these men who have operated, what percentage of infection they get, and after they get it, what results do they have? Now these cases of Dr. Colvin's and these people who have gone across the stage here have had as perfect a result from a fracture of this kind as you could expect. I think it is, therefore, rather begging the question; and it is up to us to defend the men who are brought into court for malpractice. We should make it a professional, ethical question that if we have a doctor brought into court and his patient can go across the court room as these people have done, it is up to us to defend that man and say you absolutely can't get any better result. There are a certain number of doctors who would say if this patient were operated upon you would have a good anatomical result. Let them say how many times they have operated upon cases of this kind, and what percentage of results have been bad.

Now I have been all through this period of operating upon fractures of the femur. I have done some myself; I have seen a good many; and I know that the percentage of bad results is large. There are possibly in the very lowest part of the femur, where you would have a fracture into the knee joint, then I can see, in order to preserve the function of the knee joint, that it might be necessary to operate and put the two pieces together so that you would have a good functional result in the joint. But I think from this clinic that we have had from Dr. Colvin, that it shows us that

these fractures can be treated so that you will get a good functional result.

We must defend each other. A jury of laymen look at those pictures and say, "That isn't right." It is right, and we have to defend it. I have had people brought in to me with fractures of the two bones of the wrist, with an absolutely perfect functional result—could do anything; and they would say, "Well, here is the plate, and it is bad. The bones are not in place." I say, "What do you want? Suppose you do open it and you get rigidity of the tendons? The patient may go away with a perfect anatomical result, with a very poor functional result."

DR. H. B. SWEETSER, Minneapolis: I believe that open operations on fractures of the femur are very seldom necessary. Some of the men who have taken part in this discussion have indicated that they operate on a fair percentage of their cases. Now I would like to ask them what percentage of infection they get, and, when infection occurs, what is the final result? From my own experience and from my knowledge of the post-operative results of some other surgeons, who are skillful and careful surgeons, I suspect the percentage of infection is high, and the functional results following infection are bad, and may be fatal. Treatment without operation, whatever else may happen, at least is almost never complicated by infection.

These cases of Dr. Colvin's ought to and do carry to us a very graphic lesson. We look at his pictures and we say the anatomical results are poor and some of them bad. He then shows us the patients from whom these pictures were taken and gets them to walk across the stage, and we find that functionally the results are perfect,—no limp and normal movements. It has been said here that Dr. Colvin *might* get by, but that a man of lesser reputation would surely be mulcted for damages by a lay jury if such pictures were exhibited in court. I say that such a verdict ought to be impossible, no matter what the x-ray pictures show, if the patient can walk across the court room as these patients of Dr. Colvin's have walked across the stage here. We are looking for good functional results, and we should make it a professional, ethical question to defend any doctor, no matter how obscure his status, if his functional result is good, irrespective of what the x-ray shows.

I do not deny that there are some fractures of the femur in which an open operation may be necessary, and this is especially true of fractures which extend into the knee-joint, in order to restore even joint surfaces, but I think this clinic which Dr. Colvin has given us surely proves that the number of such cases must be small.

DR. H. W. MEYERDING, Rochester: It is very gratifying to me to find that the members of this symposium agree as well as they do upon the treatment of fractures of the femur. I do not recall hearing anyone advocate very strongly open treatment of fractures of the femur as a routine. We are all agreed that recent fractures of the hip are treated best by the Whitman closed method. We are not discussing malunion, nonunion or delayed union or osteomyelitis following infection. We seem to be agreed that the Thomas extension splint, as shown by Dr. Colvin, with certain modifications as used in various clinics, is the best means of treating fractures of the femur.

There are points in my paper which I did not get to,

such as of the articular fractures and epiphyseal separation. The question of joint incongruity and permanent partial disability comes up frequently following intra-articular fractures of the femur with displacement. We could discuss fracture all day and I am sure bring out new points constantly; however, there is not sufficient time.

I think lateral traction is very valuable where we have displacements such as some of the rays presented this morning showed. Five or ten pounds overhead traction or lateral traction often will help reduce and improve the position. Tight splinting, however, should be avoided; and the use of lateral splints, as formerly were so commonly used, led to needless atrophy and interference of circulation.

DR. C. A. REED, Minneapolis: Just a word in regard to these bad anatomical results and good functional results as shown by Dr. Colvin. I think we have all had that experience, and we will continue to have them; but some of our worst anatomical results will come out with pretty good functional results. I would like to ask if after a year or two these people could return to their original occupation, whether they had the full range of motion in the knee, and such things. But simply to repeat the findings of the British Medical Association Committee that while you might get brilliant functional results with an indifferent anatomical one—the surest way to get a good functional result is with a good anatomical one. I am sure that any of us could show pictures of better anatomical results and very much worse functional results. That is the type of case that we must try to avoid. It is not just a question of whether we have a few cases; the large statistics show that in good hospital practice the functional result is not good enough so that a very large proportion can go back to arduous labor.

DR. ALEX COLVIN, St. Paul: This is the man who had the double fracture of the femur; and we showed the rather awkward position of the fragments. He came in late be-

cause his machine broke down and he could not get here before. But he was very anxious to show what good legs he had. He whispered to me just now, when Dr. Reed said that he would like to see him a year from now, "Here is a year from now!"

I have accused myself a good many times of being a procrastinator and of not being progressive enough about fractures; and I will confess that occasionally I have missed an operation that I think I might have done. But I look upon an open operation for fracture of the femur as one of the biggest operations in surgery, and one of the most difficult to do, and one of the most difficult to get a result from after you have operated. It is a dangerous operation. People have lost their lives from it. They do not lose their lives from this kind of treatment. They do get functional results.

I think it is just as big a scientific accomplishment to treat a fracture non-operatively as by operation. Indeed, it is more scientific. There are just as many scientific principles involved in the proper treatment of fracture by mechanical methods as there are in operating upon them—even more. And I would say this, that I do not think any man is justified in operating on a fracture of the femur until he has proven to himself by sufficient experience that he cannot get a result by the ordinary mechanical methods; and I think there are very few men—at least comparatively few men; I am not speaking of men in the cities with big surgical practices, who get cases sent to them from all over—but there are very few men who through the country do some surgery and bone emergency surgery and all that sort of thing—there are very few men who have the experience which enables them to say to themselves, "I know that I can't get a result any other way." The only time I will operate on any fracture is where I can convince myself that "You can't get a result any other way; you have to operate." And there was not one fracture there that I felt I could convince myself sufficiently to say that.

"CHIROPRACTORS CLAIM RIGHT TO PRACTICE IN THE CITY HOSPITALS"

Under this caption the Jamestown Journal of February 7 gives a detailed account of a hearing before the city board of public welfare at which several chiropractors demanded the right to send patients to the city hospital and to treat any already there and desiring chiropractic treatment. "For two hours," says the Journal, "the 'back breakers' argued with members of the board and health officials, finally leaving when they were assured that the board will seek legal advice on the possibilities of allowing the hospital to be used for chiropractic treatments."

It is easy enough to understand the apparent lack of a sense of the fitness of things which prompted the chiro-

practors to present their demands thus openly, but not so easy to understand how they could hold the attention of an official board for two hours.

According to Mr. George W. Whiteside, counsel of the State Medical Society, there is no question but that chiropractors who practice what they are accustomed to call their "profession" are doing so in violation of the law of the State. "Chiropractic," he says, "is scientifically unsound and should be fought as a plague—its practice here is a crime which no political expediency can condone."

Assuming the correctness of this opinion, to permit them to practice in a public institution would be making the institution an instrument in the violation of the laws of the state.—*Health News, New York State Department of Health, March 3, 1924.*

SOME NOTES ON THE TREATMENT OF TUBERCULOSIS *

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The successful treatment of tuberculosis depends on several factors. First of all the type of case must be considered, as results are possible for some patients that are not for others. The germ may have fallen in more or less refractory soil. A careful study of the history will show whether the patient comes from a "tuberculized" strain or a susceptible one; whether he has gradually become somewhat immunized himself; whether his surroundings and experiences have increased or diminished his resistance to infection; whether he has the mental and moral stamina to fight his enemy intelligently.

The duration of the infection and the degree of activity it has reached also affect the prognosis. Ordinarily it will be a simpler matter to secure satisfactory results in an early than in an advanced case. Frequently, however, a case diagnosed early will be found to come of non-resistant stock and run a rapid course. On the other hand, a moderately advanced case which has not been given a fair chance may do wonderfully well if placed under proper conditions.

Every effort should be made to secure earlier diagnosis through the study of contacts in infected families and by the fuller use of the diagnostic resources of general hospitals, every one of which should have open air wards where cases can be adequately treated while being studied. Routine physical examination of workers in industrial plants and the wider use of periodic physical examinations among apparently well people will doubtless bring to light many unsuspected cases.

In treatment various agencies and measures will be needed. The supervision of a case may have to extend several years and involve the use of a score of measures and agencies. Many of these will not be available in a practicing physician's office or in the patient's home. Usually it will be advisable for the patient to be in a sanatorium during some part of the treatment. The treatment may be outlined as follows:

TREATMENT OF TUBERCULOSIS

I. Active Stages:

A. General Measures.

1. Rest.
2. Open air.
3. Proper feeding.
4. Psychotherapy.
5. Supervision.
6. Correction of defects.
7. Careful nursing.
8. Symptoms.
9. Special treatment (Heliotherapy).
10. Specific treatment (Tuberculin).
11. Climatic treatment.

B. Local Measures.

1. Pulmonary Tuberculosis.
 - a. Control of cough.
 - b. Treatment of hemorrhage.
 - c. Treatment of pleurisy and pleural effusion.
 - d. Pneumothorax.
 - e. Thoracic surgery.
2. Laryngeal Tuberculosis.
 - a. Heliotherapy — general; local.
 - b. Local applications—sprays; direct applications.
 - c. Nerve injection.
3. Bone and Joint Disease.
 - a. Heliotherapy and light treatment.
 - b. Orthopedic measures and surgery.
 - c. Tuberculin.
4. Gland Tuberculosis.
 - a. Heliotherapy.
 - b. Tuberculin.
 - c. X-ray.
 - d. Surgery.
5. Other forms of tuberculosis.

II. Quiescent Stage:

1. Regulated rest and exercise.
2. Training in hygienic living.
3. Occupational therapy.

III. Apparently Arrested Stage:

1. Regulated rest and exercise.
2. Vocational conferences.
3. Study and supervised work.
4. Training in living with a handicap.

*Read before the Hennepin County Medical Society, Sept. 26, 1923.

IV. Arrested Stage:

1. Adequate follow-up.
2. Sheltered employment.
3. Gradual return to active citizenship.

1. *Rest* is our most powerful resource in fighting active tuberculosis as well as the best symptomatic treatment for hemorrhages, night sweats and cough. Dr. Peter Dettweiler, Brehmer's pupil and patient, was the first to utilize this resource fully and systematically. Dr. Joseph Pratt of Boston and Dr. Hugh M. Kinghorn of Saranac Lake have been particularly strict in its application. Dr. Marcus Paterson of Frimley Sanatorium in England has advocated the earlier and more strenuous use of exercise. During the activity of the disease there can be no doubt of the value of complete and prolonged rest.

2. *Open Air* has no direct action on the tubercle bacillus and is only one of many measures for increasing bodily resistance to the invading germs. Yet it is one of the very best. George Bodington of Sutton-Coldfield, Warwickshire, England, was one of the first to advocate its use, establishing a fresh air institution for the treatment of consumptives in 1840. His theories, however, did not gain much approval and Brehmer may be said to be the real founder of the modern fresh air treatment, applying it on a large scale in his sanatorium at Goerbersdorf, in Germany, about 1859. Its full application requires special equipment and technique, sheltered and screened porches, beds with easy running wheel castors, special methods of bed making, warm clothes for those who sit out of doors, etc. If these are at hand there are very few days in the year in temperate climates when outdoor life cannot be enjoyed. Automobilists find it possible to be comfortable out of doors, even in open cars, with the help of fur coats, foot warmers, etc., and patients should have all necessary equipment for outdoor living. Usually, especially for those who have lived indoors, there results a general improvement in nutrition, appetite, digestion, and sleep. Cough and fever are lessened.

3. *Proper Feeding*.—Various fads in the feeding of tuberculosis patients, such as overfeeding and high protein diet, have mostly passed out of fashion. A generous mixed diet, one that the patient can assimilate, is now considered the reasonable one. Special dietetic management will be needed in individual cases. In febrile cases it

should be simple. Milk alone may be used to advantage at times.

4. *Psychotherapy*.—The securing of the correct mental attitude on the part of the patient is usually the result of the co-operation of physicians, nurses and properly instructed relatives and friends. A patient may easily be over visited and over consulted on family affairs. His porch-mates may be too ready to discuss their symptoms at all times with him and such conversations should be discouraged. The stunned, panic stricken phase in which alarm is predominant should under favorable auspices give place to a calm facing of facts and realization of how large a portion of what makes life worth living can be salvaged. As soon as a man makes peace with his fate and faces it unafraid he has the mental attitude that helps recovery. Social service may relieve a man of worries about his family. Diversional craft work will show him that he can still interest himself in worth while accomplishment and get results. It will help him to stop brooding over his disease and to quit "practicing on a harp" as one of my patients said. Another mistake that patients often make is postponing interest in life until recovery, missing the enjoyment which is entirely possible to people who feel well and are given an enforced vacation in beautiful surroundings.

5. *Medical Supervision*.—The fact that the patient must develop habits of healthful living and that these must be drilled into him by precept and encouraging counsel makes continuous medical supervision most necessary especially in the active stages of the disease. This is one reason why the private physician, if he is unwilling to undertake the constant supervision of the patient himself, should not advise him or permit him to do without supervision, for instance "to go to a farm where there are plenty of good fresh eggs and milk as well as fresh air," but should rather refer him to a competent specialist or sanatorium for medical guidance.

6. *Correction of Defects*.—Frequently pathological conditions in the teeth, tonsils, pelvis, appendix or other organs obscure the symptomatology of the case and hinder recovery. Whenever possible these should be corrected early in the treatment of the case provided the operation itself does not do more harm than good. Ether anesthesia, especially if of long duration, is probably justly

held responsible for the lighting up of many latent tuberculous infections. Local anesthesia would be the preferable method in most cases.

7. *Careful Nursing*.—A skillful nurse trained in the technique of outdoor treatment and the rest cure can often turn the scale in the patient's favor, especially in the active stage of the disease. As tuberculosis is a common disease every nurse should be familiar with its care and a two or three months' course in the actual care of tuberculous patients in an affiliated sanatorium should be part of the curriculum of every nurses' training school.

8. *Symptomatic Treatment*. — Medicines of various kinds are needed now and then in most cases. Laxatives and astringents, expectorants and sedatives, hypnotics and alteratives all have their place. The routine use of laxatives can often be avoided by diet. Counterirritants and other local applications relieve pain. Opiates and other narcotics should be used with extreme care in the early stages of the disease on account of the danger of habit formation. In far advanced cases they can be used more freely. Palliative measures of various kinds can give a great deal of relief and comfort.

9. *Of Special Treatments* now in vogue, heliotherapy appears to be by far the most useful. However, it is not generally considered applicable to pulmonary cases. In bone and joint tuberculosis it has a most helpful influence on the general metabolism as well as upon the local lesion.

10. *Specific Treatment*.—The only specific treatment which is generally believed to have any value is the tuberculin treatment and this like heliotherapy is more useful in surgical and gland tuberculosis than in pulmonary disease. The method of Trudeau is the one generally approved in administering it.

11. *Climatic Treatment*.—Health resorts located in widely differing climates have been praised as suitable for tuberculous patients. The good reputation of some of them has been due to the excellent systems of treatment followed in them. Practically no climate is ideal throughout the year, and nearly every climate is good during a portion of the year. Northern Minnesota has a climate in many respects similar to that of the Adirondacks. Rest, peace of mind, good care, and proper food are obtainable near the patient's home. Home-

sickness and worry about finances are more common in distant health resorts. Leaving the home climate is usually attended with some risk and requires abundant financial resources.

The detail of local treatment need not be discussed at this time as we are making only a brief discussion of general principles.

Treatment in the Quiescent Stage.—While the patient is still at the sanatorium he may lose all essential symptoms and feel perfectly well. If this condition lasts two months his lesion is said to be "quiescent" according to the definition of the National Tuberculosis Association. Tubercle bacilli may or may not be present in his sputum. At this period the "administration" of exercise in gradually increasing doses is begun. The effect is to be judged by a careful study of the patient's condition at very short intervals. Records of temperature and pulse must be kept and the occurrence of unfavorable symptoms must be noted. The weight must be closely watched. In many cases the record may be kept by the patient provided his intelligent interest and co-operation are enlisted. Most sanatorium men do not try to secure definite auto-inoculation reactions by exercise after the method of Paterson. Some such plan of gradual increase as the following is usually employed.

EXERCISE ALLOWED IN DIFFERENT GRADES

1. Complete rest in bed.
- 1A. Rest in bed. Turning on side permitted.
2. Rest in bed. Patient allowed to turn on side and to sit up occasionally.
- 2A. Rest in bed. May use commode or go to bath room in wheel chair. Letter writing and reading by special permission.
3. Rest in bed. May walk to bath room. Reading and letter writing permitted. Light fancy work and light handicrafts allowed after special permission for not over one hour a day.
- 3A. Meals in small dining room. Other exercises as in preceding grades.
4. Meals in main dining room. Patient to return to room immediately after the meal.
- 4A. Reception room exercise. Short auto rides permitted, not over one-half hour. Attendance at entertainments allowed. Patient may remain downstairs after meals.

5. Fifteen minutes walking, besides exercise specified in second column. May spend evening in reception room, may attend entertainments and take exercise of preceding grades.
- 5A. Thirty minutes walking, besides exercise specified in second column. May take exercise of preceding grades. All handicraft work to be done in workshop. Permission to be secured for as much as two hours light work in all if done while sitting.
6. Forty-five minutes walking. Other exercises as in preceding grades.
- 6A. One hour walking. Other exercises as in preceding grades.
7. One and one-half hours exercise. Not over one hour walking. May work in office or do other light work up to three hours upon special permission. May take school work. Vocational training.
- 7A. Two hours exercise. Not over one hour of walking. May take exercise of preceding grades. Not over two hours of active exercise. May have up to four hours of light work or school work. Vocational training.
8. Three hours exercise. May be all work or part work. Not over one hour of walking to be included without special permission. Vocational training.
- 8A. Four hours exercise. Four hours light work or other exercise including walking. Vocational training.
9. Five hours exercise. Five hours work and other exercise including walking. Vocational training.
- 9A. Six hours exercise. Six hours work and other exercise including walking. Vocational training.
10. Seven hours exercise. Seven hours work and other exercise including walking. Vocational training.
- 10A. Eight hours exercise. Eight hours work and other exercises including walking. Vocational training.

Apparently Arrested Stage.—In the “apparently arrested” stage according to the National Association definition, symptoms must have been absent for a period of three months and tubercle bacilli must have disappeared from the sputum.

Having reached this stage in the return to health, the patient should make definite life plans and have special counsel in adjusting himself to a new kind of living. Those accustomed to heavy manual labor must in most instances choose a new vocation. Even very modest attainment in the study of English and in figuring may make it possible for a man to secure a position as supervising foreman or time keeper. For those who already have some education the state through its care for the handicapped offers special opportunities for instruction.

The actual performance of a certain amount of work at the sanatorium without relapse is the best guarantee that the patient can safely go home to less sheltered employment. The industrial colony at Papworth, in England, which operates in close association with a sanatorium, offers opportunities for intra-mural employment on a larger scale than any American institution, although most sanatoria have a few arrested cases among their employees.

Arrested Stage.—In the arrested stage, according to the National Association’s definition, symptoms and bacilli must have been absent for a period of six months. In most instances the patient will have left the sanatorium and be back facing the world again. Unless closely followed up he may return to the exact environment and working conditions that caused his downfall in the first place. He needs the counsel and encouragement of a physician familiar with his special problem and his work must be within his limited capacity. Often the way the hours are spent when he is not working determines his fate. An indoor occupation may be more suitable than an outdoor one that requires much muscular exertion. Working indoors a limited number of hours and sleeping out gives the patient as much fresh air as working out of doors and sleeping in.

As stated in the beginning of the paper many of the agencies which must be used in the treatment of tuberculosis are not within the control of any physician, yet at some time during the course of the treatment of nearly every case the private physician will have to shoulder considerable responsibility. He must ordinarily make the diagnosis and has at his call the resources of the general hospital. He should have the privilege of having his patient at the hospital and the hospital should provide suitable treatment for his patient while there.

The sanatorium has a definite place in the mechanism for securing the best results for his patient and the physician assumes a heavy responsibility who does not advise sanatorium treatment at the proper time. The modern sanatorium offers the patient the following advantages:

- Conveniences for "cure taking"
- Freedom from responsibility
- Constant medical guidance
- The moral support of other patients taking the same treatment
- Rest hours free from disturbance
- Nursing care always available
- Training in the protection of others from infection.

After a course of training at a sanatorium, home treatment is more likely to be successful than if attempted first. There is no reason, however, for sending moribund patients long distances to a sanatorium. They should be cared for at home or in a local hospital.

The responsibility for the medical follow-up of cases discharged from sanatoriums must rest largely with the private physician. The state will doubtless do much more than it has in affording him the counsel and active assistance of members of the sanatorium staff. This service can be furnished the physician along with free sputum examinations and other diagnostic facilities. To secure permanent results there must be active co-operation between the physician and the sanatorium. The physician must be familiar with the special form of home treatment required, and for this purpose the general hospital must provide him actual experience and training.

The sanatorium needs the skill of the hospital staff in the treatment of surgical complications and special conditions.

The treatment of a case of tuberculosis may last many years. The patient may promptly get well or die; on the other hand, he may neither get well nor die and for a series of years may be a decidedly handicapped citizen. That he have the maximum degree of health possible and be as much of an asset to the community as his health will permit requires the co-ordinated work of physicians and sanatoria as well as of other agencies. The State Advisory Commission is directing the work in Minnesota and should have the cordial co-operation of every physician and every institution.

OSTEOCHONDROMATOSIS OF THE HIP* JOINT*

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Osteochondromatosis is a rare pathologic condition of the synovial membrane found in certain joints, bursæ and tendon sheaths, in which the stratum synoviale takes on the property of forming osteocartilaginous bodies. The recent work of Jones in which he thoroughly searched the literature and studied the twenty cases that had been observed in the Mayo Clinic until November, 1923, gives further weight to the theory that the condition should be classified as a benign neoplastic process. Since the completion of this study, a patient has come under our observation with the condition in the hip joint. This is the only patient in our series whose hip joint is involved, and we have been able to find only one mentioned in the literature, that by Eden, in 1914.†

ETIOLOGY

Various etiologic hypotheses have been advanced; these may be grouped as infectious, traumatic, embryologic, and neoplastic. Most writers have been inclined to place little value on infection as an etiologic factor. Some of them, however, lean toward the infectious theory (Bolton, Halstead, Reichel and Hahn). Jones, after reviewing the literature and our cases, concluded that infection did not play a part of any consequence in the etiology. Trauma has been stressed by certain writers (Humphry, Davis, Carothers, Henderson, and Fisher) as an etiologic factor, and Jones, in reviewing our records, found a definite history of trauma, usually long before finding the loose bodies, present in eight.

The fact that all the tissues involved in this process are developed by differentiation of the same mesenchymal tissue is emphasized by Whitelocke, Lotsch, Henderson and Fisher. During development in the embryo, some of these cells degenerate to form the joint cavity, some differentiate to form the joint cartilage, and some to form the synovial membrane. This embryologic theory is closely al-

*Read before the Minnesota Academy of Medicine, St. Paul, February 13, 1924.

†In the interval between sending this article in for publication and receiving the proof, we have operated on another patient with loose bodies in the hip, and removed twenty-seven bodies, fourteen attached by pedicles and thirteen free. A posterior incision was used.

lied to the neoplastic, and it is necessary to accept this basis before the latter is discussed. Ziegler defines a neoplasm as "a new formation of tissue, apparently arising and growing independently, having an atypical structure inserted uselessly into the organism, possessing no function of service to the body, and showing no typical termination of growth." Osteochondromatosis grows slowly, is expansive rather than infiltrating, mitotic figures are absent, it is encapsulated, never metastasizes, does not tend to recur after removal, and is composed of well differentiated cells. These findings are characteristic of benign neoplasms, and therefore it is logical to classify osteochondromatosis with this group.

PATHOLOGY

Joint capsules are composed of two layers, a stratum fibrosum and a stratum synoviale, the former characterized by dense connective tissue, the latter by loose connective tissue containing fat, blood vessels and lymphatics. The stratum synoviale has an inner smooth lining, composed of parallel fibers of connective tissue and round or stellate cells with large nuclei. In areas of unusual pressure these cells with the large nuclei are infrequent, in others they are arranged in a single layer, whereas, especially in the crypts and pockets and margins of the joint, this mesothelium may be three or four cells in thickness (Lewis and Stöhr). Laennec, Rokitansky and Brodie thought that the bodies might arise from either layer, but Kölliker and Eden believed that they came from the stratum synoviale. Jones, from his study, concluded that the bodies arose from the stratum synoviale. Müller, Hagemann, Kienböck and Henderson mention that the point of origin frequently is at the juncture of the joint capsule with the periosteum, where the mesothelial cells are in greater number. However, there is no doubt but that any portion of the synovial membrane may be the site of the bodies. They may start either as osteomas or chondromas. The cartilage may be hyalin, fibrous, calcified, or a combination of these forms. Bone in these bodies may be developed either directly from connective tissue by the membrane method, or by preformation in the cartilage. The most typical form is a spherical shell of bone surrounded by cartilage and fibrous tissue, and filled with vascular fat and spurs of bone. The bodies are at first attached by pedicles, through which they get their blood supply. Due to their becoming larger and heavier, and the nat-

ural trauma associated with joint motion, they finally break their pedicles and wander as free loose bodies. The question as to whether the bodies receive sufficient nourishment from the synovial fluid to increase their size is not definitely settled, but the fact that, on studying a section of a free body we find the outer layer of cartilage in an excellent state of preservation, the nuclei staining well, whereas deeper in the body the cells show evidence of degeneration, would lend weight to the theory that the fluid does nourish the body. It seems probable, although it is not proved, that cartilage may proliferate under these conditions. In the detached bodies the bone is invariably found to be necrotic, whereas in the attached bodies with a blood supply, growing bone is found.

SYMPTOMS

The symptoms vary with the joint involved, according to whether the bodies are numerous, still attached, or free, their size, and so forth. Often the first complaint is of a little stiffness and inability to put the joint through a full range of movement. The common symptom is, of course, catching or locking of the joint, causing pain and a feeling of insecurity. Objectively the bodies may or may not be palpable, depending on their number and size, and the covering over the joints.



Fig. 1. Loose bodies in left hip joint.

REPORT OF CASE

Case A446938. The patient, aged thirteen years, presented himself for examination November 9, 1923. He was well developed, 5 feet, 4 inches in height, and weighed 115 pounds. The family history was negative, and he had had

no infectious diseases. Seven and one-half years before, when he was six years of age, a ladder, which he was climbing, broke, and he fell a distance of 15 feet, landing on his feet. He was not badly hurt, but limped on account of pain in his feet. The following winter while skiing he spread his legs to such a degree that it hurt him considerably, and he could remember limping for quite a while on account of pain in the hip. In the summer of 1922 he was

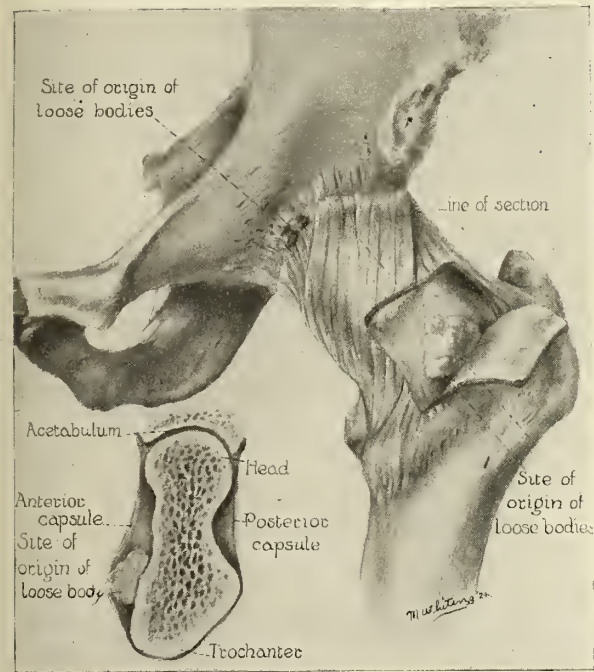


Fig. 2. Site of origin of bodies.

thrown from a truck, striking hard on the left hip joint. After this there was slight pain on movement of the hip. Four weeks before our examination, while riding his bicycle, he had an attack of quite severe pain, and a locking of the left hip lasting ten minutes before he was able to limp home. He kept quiet for a week, and although the hip has been sore and painful, he had had no more lockings. He walked into the office with a slight limp, but without cane or crutch.

Physical examination and examination of the urine and blood were essentially negative; the Wassermann reaction was negative. There was slight restriction of motion of the left hip joint in all directions. On flexing the hip, thus relaxing the anterior capsule, a mass could be felt, and some of the bodies could be palpated. The x-ray disclosed multiple loose osteocartilaginous bodies in the left hip joint (Fig. 1). Roentgenograms were made with the hip in inversion, eversion and in the straight position. It was impossible to count the bodies, but it was thought that there were between twelve and twenty.

The joint was exposed by a small Smith-Peterson incision running parallel to the long axis of the neck made into the capsule, and a number of free osteocartilaginous bodies, thirty-one in all, were removed. The gloved finger was then introduced, and an enlargement resembling an exostosis (Fig. 2) could be felt anteriorly at the point where the

synovial membrane was reflected from the anterior intertrochanteric line. This appeared to be the main site of the origin of the loose bodies, the mass having its origin just where the synovial membrane was reflected from the bone. This exostosis was smoothed down by the chisel and a thorough search of the joint for the loose bodies made by aid of a gallbladder scoop. A slightly movable, encapsulated mass could be felt at the point where the synovial membrane was reflected from the acetabulum at the upper border, and on cutting into this, two loose bodies popped out, indicating that the bodies had their origin not only at the site of the exostosis, but elsewhere (Fig. 2). As nearly as could be ascertained by visual inspection, which was naturally limited, and by palpation, the picture was not like that seen in some cases of osteochondromatosis, in which the synovial membrane is studded with bodies. The bodies varied in size from 1.5 cm. to 4 mm. (Fig. 3). Microscopic sections showed cartilage and bone in varying amounts, the amount of bone being greater than usual (Fig. 4). We did not feel sure that all the bodies had been secured, particularly from the posterior part of the joint, but I was unwilling to make a posterior incision at this time. The operation had already taken thirty minutes, and although

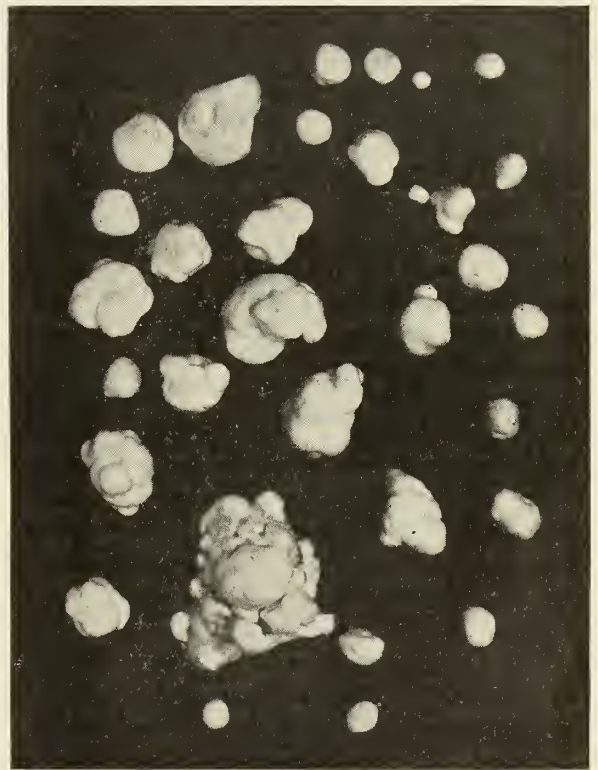


Fig. 3. Thirty-one loose bodies removed.

the patient's condition was excellent, I felt that the risk of infection would be increased by further search through another incision. The incision was closed and the patient put to bed without a cast. His convalescence was uneventful and he went home on the tenth day with motion quite free. A roentgenogram (Fig. 5) taken after operation showed that some loose bodies were still present. The patient and

his family were acquainted with this fact and told that if further symptoms arose, he was to return for exploration by a posterior incision.

Comment.—The history and findings in this case serve to emphasize certain points and facts concern-



Fig. 4. Section of loose body illustrating endochondral ossification. (a) Dark area represents cartilage. (b) Lighter area represents bone. (c) Fibrous tissue. Both cartilage and bone were necrotic.

ing osteochondromatosis. The condition was longstanding, and the patient had sustained three severe traumas to the left hip joint. Severe pain finally forced him to seek relief. In this case, therefore, from an etiologic viewpoint, trauma was a definite factor. At operation a definite tumor formation was found on the anterior intertrochanteric line (Fig. 2), at a point where the synovial membrane was reflected from the bone and where the stratum synoviale was probably three or four cells deep. We found, also, two bodies in a pocket at the superior margin of the acetabulum (Fig. 2) where the synovial membrane was reflected from the bone. These findings serve to corroborate the embryologic and neoplastic theories mentioned. Although Eden's case was the only one we found reported in the literature, undoubtedly other cases have been seen and treated surgically. Possibly they have not been reported, or are so buried in the literature that we could not find them. Eden treated his patient radically, performing an excision. The patient later was able to carry on his duties as a hospital orderly. From our standpoint this procedure appears too radical. Our patient is young, and if he has further trouble, there will be ample time to consider more radical procedures.

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Fig. 5. Several bodies still in posterior portion of capsule after operation.

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First of all, the health officer must in his own heart entertain for the medical profession the highest degree of respect. The health officer who outwardly cultivates the medical profession and who inwardly has contempt for their attainments in the public health field is sure to be found out. This does not mean that the health officer must or that he can regard the members of the medical profession as experts in public health. Distinctly they are not, but the fields of public health and medical practice have certain things in common, while, outside of this common ground, each profession covers much not included in the other. It should be the aim of every health officer to have very clear ideas concerning this common field, and in it to secure complete co-operation of the two professions.

At this point it may well be asked just what right has a health officer to feel that he is entitled at all times to the cordial support of the medical profession. This question has often been answered by stating that the medical profession differs from all other human callings in that its members are frankly devoted to the betterment of humanity and that, for this reason, they should always be willing not only to respond to all demands for charity work but should also regard it as their special privilege to give freely of their time in promoting the cause of public health.

While there may be much in this argument, it is safer to assume that doctors, first of all, are men constituted as are other men, having their own livelihood to consider and not receiving such special consideration from the general public as calls for their giving to the public more than do the members of other professions.—*E. C. Levy, M.D., Am. Jour. Pub. Health, Dec., 1923.*

THROMBO-ANGIITIS OBLITERANS: WITH CASE REPORT*

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Thrombo-angiitis obliterans is a disease of unknown origin of the blood vessels or blood, characterized by obliteration of the vessels of the extremities, and followed by certain trophic and vasomotor disturbances.

Etiology.—It is a comparatively rare disease. It was first fully described by Leo Buerger, of New York. He believes it to be of an infectious origin of unknown etiology. Almost all of his cases occurred in young men, twenty-five to forty years of age, and of Hebrew descent, who were as a general rule heavy cigarette smokers. Willy Meyer¹ believes that the smoke poisons from cigarettes affecting a previously weakened nervous system may be largely to blame. Heredity probably plays no part, although more than one case in the same family has been reported. There is no connection between this disease and diet; since it occurs in males and not in females, some have advanced the theory that the endocrine glands play an important rôle. There are no known infectious diseases that are precursors of thrombo-angiitis, although typhoid fever is blamed by a few.

T. Mayesima² advances the theory that there may be an increase in the viscosity of the blood that is responsible, and Willy Meyer¹ further explains it as due to a change or disease of the blood itself that may cause the blood to coagulate when it flows through vessels of smaller calibre.

Pathology.—Leo Buerger³ describes it as an occlusive thrombosis of vessels with inflammatory reactions of vessels and with the end result of ulceration and gangrene. Veins either superficial or deep or both are involved in about 40 per cent of the cases.

He finds that it is a thrombotic process in the arteries and veins, occurring usually in the larger vessels, starting distally and working up. The thrombus is a red or mixed clot with giant cells, leucocytes, and disintegrated cells. The process is preceded, probably, and accompanied, by acute inflammatory changes and followed by organization and canalization of thrombus. Surrounding the ves-

*Presented before the annual meeting of the Minnesota State Medical Association, St. Paul, October, 1923.

sel there is usually fibrotic tissue that binds down artery, comites and accompanying nerves.

Laboratory Findings:

1. Chemical blood examination.

Bernhard⁴ found that the chemical blood examination was normal for its nitrogenous constituents, cholesterol, chlorides, the carbon dioxide combining power of the blood plasma, and calcium. However, he found a definite hyperglycemia reaction peculiar to this disease.

2. Microscopical blood examination.

H. M. Thomas⁵ reports a case of persistent leukocytosis.

3. Stomach analysis: negative.

4. Roentgenolgy: negative.

Bones show no changes until attacked by gangrene or osteomyelitis, which usually occurs late in the disease.

5. Basal metabolism: normal.

Symptoms.—The symptoms at first are rather vague, and often diagnosed as rheumatic, weak foot, frost bites, et. cetera. Among the first symptoms are pain in the extremities, coldness, tingling, and cyanosis. As the disease progresses, the pains usually increase in severity and may become excruciating, or may take the form of intermittent claudication; the pain may be absent. The extremity usually assumes a congested appearance—rubor—in the dependent position, or a waxy livid hue when elevated. There is either an absence of the pulse or a very faint one, depending on the stage of the disease. There may be scattered phlebitis—the patient complaining of “hard lumps” or “strings” under the skin. Ulcerated areas usually form, which are very rebellious to treatment. The ulcerated condition may heal, and subsequent ulcers may form, which eventually develop into gangrene. This may be a wide, rapidly spreading gangrene, or it may be confined to the distal digits. The lower extremity is usually involved—very rarely the upper.

To sum up we may say that the important symptoms are pain, intermittent claudication, scattered phlebitis, rubor or blanching of foot depending on posture, disappearance of pulse, ulceration and gangrene.

Complications.—As this is usually a chronic disease, any of the infectious diseases may complicate it and end the scene.

As these individuals suffering from it are more or less of a neurotic temperament, they get to worrying about their condition, so it is not uncommon

to find various mental states. Some even get so mentally deranged as to commit suicide.

Moist gangrene and pyemia are most to be dreaded, as when these develop they are usually fatal.

Diagnosis.—The clinical diagnosis as given by Buerger⁶ rests upon the following:

1. “The racial (Hebrew) and sex (male) predilection.
2. The early involvement of the lower extremities.
3. The early symptoms of pain or intermittent claudication.
4. The presence of migrating phlebitis.
5. The evidence of pulseless vessels.
6. The presence of blanching of the extremity in the elevated position.
7. The existence of rubor in the dependent position.
8. The relation of hyperemic phenomena to posture.
9. The absence of simultaneous, symmetrical involvement.
10. The slow, progressive chronic course terminating in gangrene.”

Differential Diagnosis.—The diseases that may be confused with thrombo-angiitis obliterans are Raynaud's disease, scleroderma, sclerodactyl, syphilis, tuberculosis, diabetes, arteriosclerosis, erythromelalgia.

Raynaud's disease is a disease of unknown etiology. Its pathology is not exactly known. The lesion is thought to be somewhere in the central nervous system. There is alternating blushing and blanching of the foot. This disease is characterized by intermittent attacks with normal intervals. The pain has always a distinct nerve distribution, and usually in symmetrical parts. The areas affected in the thrombo-angiitis obliterans always correspond to the vessels affected, which is not true of Raynaud's disease. There is always atrophy of the distal phalanges in Raynaud's disease which you do not find in the thrombo-angiitis obliterans, until gangrene has advanced to such a degree as to cause definite changes in the bones.

Diabetes and senile gangrene are usually easily differentiated by the physical and laboratory findings.

In erythromelalgia the plantar surface of the foot is red and glistening while the rest of the foot is pale and atrophic.

Both scleroderma and sclerodactyl can be differentiated by the fact that there is atrophy of the distal phalanges, and by the first stage of hard edema.

In syphilis there are usually other signs of syphilis present along with a positive Wassermann.

An ulcerated condition in cutaneous tuberculosis is usually accompanied by changes in the lungs, and in the later stages it is easily distinguished from thrombo-angiitis obliterans.

Course.—Thrombo-angiitis obliterans runs a chronic course. It usually starts with vague rheumatic-like pains, intermittent limping, ulcers, and finally gangrene develops. It may end fatally either by wide spreading gangrene, pyemia, or by thrombosis of some of the important vessels to the brain, liver or lung, or by some other intercurrent disease. Some cases seem to recover entirely.

Treatment.—The treatment may be either medical or surgical or a combination of both. Emphasis cannot be laid too strongly on the conservative treatment first, which of course entails an early recognition of the disease. Many a case is reported in the literature where a wrong diagnosis was made, and treatment instituted that resulted disastrously for the patient. Any local surgery of the ulcerative process in the disease will invariably end in gangrene.

Steele,⁷ of Philadelphia, uses large doses of 2 per cent sodium citrate intravenously along with hot air locally and 10 grains of potassium iodide, internally three times a day. His treatment is carried out over a long period of time—a year or more.

Sinkoe,⁸ of Atlanta, has successfully used the Bier's suction apparatus.

Willy Meyer⁹ advocates the use of Ringer's solution by hypodermoclysis in conjunction with intravenous solutions of sodium citrate, glandular extract, and, if needed, conservative surgical treatment.

H. F. Wolf¹² has been successful with diathermia.

After gangrene has set in it is best to mark time, if possible, with intravenous solutions of sodium citrate, hypodermoclysis of Ringer's solution with potassium iodide internally, heat and massage until there is definite demarcation, and then do as little surgery as is consistently needed.

High amputation should not be resorted to unless all other measures fail, and the patient is in great danger of his life.

All foci of infection should be removed.

Arterio-venous anastomosis has not been successful by all that have tried it, so it is not to be recommended as a primary measure.

Heat or Bier's suction apparatus are both undoubtedly of some value.

The following case is interesting because it emphasizes the need of very careful histories and examinations, before minor surgery of the feet should be undertaken. There are a number of cases reported where the patient suffered the same consequences as this one did, just because the surgeon was too ready to use the knife. Mr. H. D. had an ulcerated condition under his big toe which had resisted all home treatments. He consulted an orthopedist, who immediately excised the ulcerated tract and put on a salicylic acid dressing, to remove the remaining calloused condition. In about twenty-four hours the foot became greatly inflamed, and painful and in another thirty-six hours gangrene had set in.

It is interesting from another standpoint because this patient was not of Hebrew descent, as are most of the cases reported.

Before presenting this case due credit must be given Dr. Edward Evans, of La Crosse, Wis., for making the diagnosis.

Present complaint. Mr. H. D., aged 37. A lumberman by trade, came to me on November 24, 1921, complaining of an ulcerated condition under the proximal phalanges of big and little toe.

Family History. Father living and well at the age of 62. Mother died at age of 65, from heart failure. It is interesting to note that the mother always had trouble with her feet. She was troubled considerably with rheumatic pains in the legs and never was able to walk any distance without resting. It was common to have her complain bitterly at nights with severe cramps in her thighs. Two brothers living and well. One sister dead, of measles. Otherwise family history was negative.

Marital History. Married 15 years. Two children living and well. No miscarriages. Wife living and well.

Occupational History. Lumberman for last eighteen years.

Past History. Previous health: He always enjoyed fairly good health. He has had considerable trouble with his feet for last fifteen years, and in 1903 he had typhoid fever. Tonsillitis often while a child. No other diseases.

Venereal: Negative.

Head: Negative.

Cardio Respiratory: Occasionally some dyspnea on climbing stairs.

Gastro Intestinal: Negative.

Genito Urinary: Negative; no symptoms of diabetes.

Skin: Negative, except for calluses under right foot.

Weight: About normal.

Habits: He was not a total abstainer of liquor, but very seldom used same to excess. Smokes about twenty cigarettes a day and cigars and pipe occasionally.

Present Illness. Patient has had rheumatic pains in his feet for years and for about the last ten years has had occasional spells of severe cramps in thighs, coming on shortly after going to bed and lasting from fifteen minutes to three hours. These pains have been coming on more frequently and severe during the last few years. Lately has had pains in calves of legs on walking any distance, which disappeared on resting. In the fall of 1919 he developed an ulcer under the big toe of the left foot, and about six months later developed one under the right big toe. The left toe healed up in about six months. The treatment consisted of hot foot baths, and frequent applications of a mild antiseptic. The ulcer under the right big toe has resisted all treatment.

Physical Examination. Patient a well developed male, age 37, of French, Irish, and German descent.

Head: Negative.

Neck: Negative.

Thorax: Negative, except for slight mitral regurgitation.

Abdomen: Negative.

Extremities: There is a perforating ulcer under the big and little toe of right foot, with considerable callus formation surrounding. The foot assumes a congested mottled appearance in the pendent position, and pale appearance in the elevated. There is an absence of the pulse in the anterior and posterior tibial in the right leg and dorsalis pedis in the left but it is present in the popliteal. There is an old scar on the left big toe from a previously healed ulcer.

Reflexes: Normal.

Blood Pressure: Systolic 125, diastolic 80.

Hemoglobin: 85 per cent. **White blood cells:** 9,500.

Urinalysis: Negative.

Course. In February, 1922, patient consulted an orthopedist, who immediately cut out ulcerated edges and put on a salicylic acid dressing, on the calluses. In a few days gangrene set in, involving three of the toes and an area on the dorsum of the foot. On February 21, 1922, the patient consulted Dr. Edward Evans, of La Crosse, Wis., who made a diagnosis of thrombo-angiitis obliterans.

Patient on admittance to the hospital presented the following: Temperature 102 degrees, pulse rate 100, respiration rate 20. Right foot was very considerably swollen for a couple inches above the ankle. Great redness of the whole dorsum of the foot, though plantar surface was not swollen or reddened. The little toe was entirely gangrenous, black, dead, and the metatarsal phalangeal joint of this toe was open and the bone exposed. Under the ball of the great toe there was a small perforating ulcer which did not seem to reach the tendon. There was some blistering and blackening of the skin and one small superficial patch of gangrene just back of and outside the nail; did not seem to be any suppuration under the nail. The patient had the history of having had quite a high fever.

The subsequent course was one of progressive gangrene with infection until all the toes excepting the middle were involved. The foot was entirely healed by April, 1923.

However, it is still cold and clammy and has only faint pulsations in vessels and becomes edematous, if it is used very much.

Clinical Laboratory Reports. Urine showed a trace of albumin on three occasions, while in hospital. Blood examination, Feb. 21, 1922: hemoglobin 96; red count, 4,200,000; white count, 16,000; polymorphs, 94 per cent; blood sugar, .09 per cent. Patient has shown a persistent leukocytosis ever since.

Roentgenology report: Negative.

Treatment. The treatment consisted of heat, intravenous injections of 2 per cent sodium citrate or normal saline, massive internal doses of potassium iodide, mild antiseptic local dressings, and conservative surgical treatment. Patient was given in all about fifteen intravenous injections, of either normal saline, or 2 per cent sodium citrate. Two hundred to 800 c.c. were given at each injection.

Two minor operations were performed by Dr. Edward Evans.

The first one consisted of removing some dead gangrenous and infected tissues, on the dorsum of foot, and opening wider the sinus under the little toe, to permit better drainage of pus.

The second one was performed about five months after gangrene had started and consisted of removing stump of big toe, back to tarsal bone, as there was a persistent infected sinus at base, and amputation of second toe, as this also had a persistent infected sinus leading to its proximal joint. During this operation it is interesting to note that there was very little blood lost, about twenty drops, showing a very poor circulation. No sewing was undertaken. The foot healed completely in about nine months after last operation was performed.

Conclusions. This is undoubtedly a case of thrombo-angiitis obliterans. There are a few points of special interest in connection with this case, namely:

1. The patient was not of Hebrew descent.
2. The value was shown of a careful history and physical examination before any surgery of the extremities should be undertaken.
3. There has been undoubtedly a persistent leukocytosis present in this patient, analogous to the case reported by H. M. Thomas.⁵

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DISCUSSION

DR. J. F. CORBETT, Minneapolis: I am very glad that Dr. Christianson has taken the time and made the effort, in a very busy life, to give us this carefully prepared paper. Now, why is thrombo-angiitis obliterans an important subject? In the first place, it affects young individuals; in the second place, it is a slowly progressive disease—it will go through a long series of years; and, in the third place, it is usually an intensely painful disease.

In the early diagnosis we have no cardinal points that I can enumerate. These cases sometimes present a picture of an osteomyelitis. Frequently they are operated upon for osteomyelitis of the great toe, probably due to the fact that the bones early undergo a lack of nourishment. Other cases are thought to be cases of neuritis. All cases have an antecedent history of pain and usually the characteristic of the pain is that it comes on with exercise. An individual may be perfectly free from pain for a long period of time. Let him walk six blocks; then the pain comes on and it will be so intense that, no matter where he is, he will stop and try to support himself in some way and rest his leg.

Early there is a change in the vessels. Oftentimes before gangrene develops, before we have absolute characteristic local appearance, the vessels can be distinctly palpated. Unlike senile gangrene this does not start at the periphery and work backwards, but is very apt to involve some of the larger vessels early. Moszkowicz's test for the collateral circulation, palpation of the superficial arteries for pulsation, palpation for consistency, are important points.

Now, what is there in the treatment? Amputation is a very poor treatment for thrombo-angiitis obliterans. We have been taught, as a surgical principle in senile gangrene, to operate at the lower third of the thigh; but amputation at the lower third of the thigh in thrombo-angiitis obliterans is often followed by some disastrous consequences. Any local operation, I believe, is apt to be followed by very severe and disastrous consequences unless very careful tests of the collateral circulation have been made and the proper point of amputation is selected.

Then what have we in the way of treatment if amputation and operation is not available? Bier's treatment properly applied—and by Bier's treatment I do not mean what is so commonly understood as Bier's hyperemia, which is mainly the application of elastic bandages, but rather the obtaining

of hyperemia through the agency of heat. Bier has published a beautiful little monograph, telling us exactly how to use Bier's hyperemia treatment of hot water; go from mild cold water to mild warm water and as time goes on increase the range of temperature, and by that means put the vessels through a course of gymnastics. Sometimes the patient has so much pain that he will not do that and I have used another expedient, that is to develop collateral circulation by the application of moist heat at the exposed points of the vessels, for instance, the popliteal space or in the groin.

I have seen a man with one leg already amputated, with a sloughing stump, with some process manifest in the other leg, where disaster seemed inevitable, to yield to this sort of treatment. If the condition was very severe, simply wrapping the affected part in heavy cotton and keeping it warm has sometimes allayed that sort of a condition. The use of citrate, I believe, has not passed the experimental stage. At one time we were giving subcutaneous injections of Ringer solution, but that has been abandoned. Most successful results have been obtained by the use of the Bier hyperemia treatment.

DR. EMIL S. GEIST, Minneapolis: Dr. Christianson has given a good exposition of practically all we know at this time regarding this mysterious ailment. He reports a rather advanced case in which progress was very favorable. Unfortunately, this does not happen in those advanced conditions where extensive gangrene has already set in. I am sure that Dr. Corbett did not want to say that amputation is never necessary, because in advanced cases amputation occasionally is indicated. When amputation is indicated it should be high, above the knee and above the bifurcation of the femoral artery.

Some months ago I prepared a paper on foot conditions which will be published shortly, which involves the study of seven hundred eighty-one consecutive cases of foot disability. In twenty-five of these cases, the foot complaint was directly attributable to interference with the arterial circulation. The symptoms were usually bilateral, it usually appeared in Jewish males, the average age was fifty.

As to symptoms, there were pain at night, cramps on use, complaints of feet getting cold easily; sometimes there occurred swelling and numbness; the dorsalis pedis pulse was absent in all of them. X-rays occasionally showed atheromatous changes. The wearing of arches and braces usually increased the discomfort. There is no doubt in my mind that tobacco, coffee and other stimulants play a considerable rôle in the etiology of this ailment.

As for treatment, Dr. Christianson has well and wisely outlined the treatment of these early cases, based upon the early recognition of the disease. In addition to what has already been said regarding therapy, heliotherapy should be considered. I believe that this remedial measure is distinctly indicated and has been of distinct benefit in a considerable number of my cases. During the past few years, Koppis, Schmaff and others have operated on the femoral artery, doing what is termed periarterial sympathectomy. I have had no experience with this operation.

DR. EDWARD EVANS, La Crosse, Wis.: Those of us removed from the large centers of scientific investigation, reading the literature of thrombo-angiitis obliterans, I

think get more confusion from it than anything else. Apparently very little is yet known about the fundamental underlying pathology of the disease. The case report as given so splendidly by Dr. Christianson was, I think, undoubtedly a case of this sort. Until we know more about its underlying pathology I think we have only to go along experimentally, feeling our way and, as Dr. Corbett has said, not do too much.

One thing I would like to say, as one who has been interested for a very long time, both actively and otherwise, in state medical associations, I cannot help saying that I feel it is a splendid thing when you men make up these programs for the state societies to get young men from small places engaged in the general practice to present papers. I think it was Sir James Mackenzie who said that until we get back to the clinician who first saw the case and get his viewpoint of it, we are not going to get very far along clinical lines. I am mighty glad to know that Dr. Christianson, in spite of the demands upon his time through his busy practice, found the time and had the scientific spirit and clinical acumen to present a paper like that to this society.

DR. MOSES BARRON, Minneapolis: This subject is very interesting because it deals with one of those diseases concerning which we know very little. I had the opportunity of studying two cases. Both of these patients were Russian Jews. The two types of treatment suggested were used in these cases. The first case was that of a man about forty-five years old who had had a history of pain in his foot extending over a period of about twelve to fourteen years. I saw him in consultation with a surgeon and at that time there was an area of gangrene over one of the toes. He was complaining of severe and excruciating pains. He was sent to a hospital and there he was given repeated injections of sodium citrate. At first it was thought there was some improvement, but later the pain became severe again and an operation was advised. A low amputation was performed, but gangrene set in in the flaps and the leg had to be re-amputated higher up. Shortly after this, however, the patient died.

The second case is of unusual interest. This patient also was in the forties. He had complained of pain in the toes of one of his feet for a long time. The pain was constant and so severe that he could not get any rest. Many nights he would not get more than one or two hours of sleep. He would pace the floor most of the night. He consulted one

doctor after another without much relief. He had visited doctors in other cities. I happened to see him during several of his attacks of pain at night. The history together with the appearance of the foot suggested strongly thrombo-angiitis obliterans. He was being treated at the time by a surgeon with heat and other measures with very little relief. He then developed pain in the great toe of the other foot. He was advised to see a chiropodist, who at once diagnosed it as an ingrown toe-nail. The chiropodist attempted to treat the toe-nail. This resulted in infection and a rapidly spreading gangrene of the great toe. The gangrene was spreading so rapidly that the surgeon was at once called and the patient ordered to the hospital for operation. An amputation was performed rather high up the leg. The patient made an uneventful recovery, and the very striking feature of this case is that he has had practically no pain since in the originally affected leg, though it was the other leg which was amputated. I examined the tissue of the amputated leg. It was typical of thrombo-angiitis obliterans. The anterior and posterior tibial arteries with their branches appeared like pipe stems, or rather cords of tissue. Microscopically, they showed the lumina occluded with the fibrosis, in some areas showing blood pigments as from an organized thrombus. There was a leukocytic infiltration throughout the blood vessel walls extending into the adventitia. The gross and microscopic pictures were identical with those described by Buerger.

The interesting facts in the above cases are that one man was treated with sodium citrate with no relief, and later he died following amputation. The second case was not treated with sodium citrate but relief was obtained by having the other leg amputated than the one which gave him the excruciating pain. The diagnosis of this case was established by gross and microscopic study.

DR. H. W. CHRISTIANSON (closing): I have been asked why it attacks the Jews more frequently than other races. I think that it is Willy Meyer, of New York, who believes it is partly due to a previously weakened nervous system. That is, the Jews have been oppressed for many centuries and consequently have acquired a neurotic temperament. He believes that for this reason, the disease is more prevalent among the Jews.

The blood pressure determinations are usually sub-normal. However, although the determinations usually run from sub-normal to normal, exceptions show a slight rise. The reason for this, I cannot explain.

STUDENTS' HEALTH SERVICE AT THE UNIVERSITY OF MINNESOTA

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Although for ten to fifteen years numerous of the leading American universities have had organized departments to care for the health of their student bodies, the University of Minnesota made no provision to assume this responsibility until after the outbreak of the late war. Then with the establishment of a Reserve Officers Training Corps at the university, the United States Army provided medical service for students belonging to this training corps. The advantages to be derived from this medical service were so evident that arrangements were made by the university authorities to extend the service to all students of the university. In 1918 a beginning was made and the first staff, in reality an emergency one, was organized.

The first two years of this new organization were particularly trying ones. The war made it difficult to obtain sufficient and satisfactory medical service and the two years of influenza, which happened to come at this time, swamped even the most highly developed of medical institutions. The Students' Health Service, however, was able to weather the storm and since then has been rapidly developing into an efficient, scientific organization for the protection and conservation of the students' health.

PURPOSE

The purpose of the service, simply stated, is to assist each student to have and to enjoy the advantages of the best possible health. To accomplish this purpose, however, numerous lines of activity are necessary. Physical defects must be discovered and assistance given to the student in correcting them. Precautions must be taken to prevent the introduction and spread of communicable diseases. Medical advice and care must be made available so that students will seek care for diseases while they are still in their incipency; and the student body must be educated as to the value of periodic physical examinations and regular medical service.

CLINICAL STAFF

The staff of the Health Service for the current year consists of fourteen physicians, eleven den-

tists, ten graduate nurses, three dental assistants, one laboratory and x-ray technician, stenographers, clerks, etc. Of the physicians, six are on full time and eight on part time; of the dentists, one is on full time and ten on half time. The staff includes physicians well trained in internal medicine, diseases of the chest, surgery, ophthalmology and otolaryngology, physical therapy, gynecology, and dermatology and genito-urinary diseases. With such a staff consultations are frequent, and the advantages of group medicine are available to every student. The students are also encouraged to call in consultation at their own expense physicians not connected with the Health Service staff. In cases in which students cannot afford to pay or in which staff physicians desire consultation for their own satisfaction, the various clinical departments of the Medical School have generously given their services.

EQUIPMENT

The Health Service maintains two institutions, one on the main campus and one on the agricultural campus. The former is temporarily located on the ground floor of Pillsbury Hall. This location near the center of the campus is a happy one, but the building and the available space are far from satisfactory. It is hoped and expected that within a few years a new building will be erected for the Students' Health Service. This building, too, should be situated on the academic campus and as near to its center as is possible. The expense of maintaining a Health Service so situated will be greater than though it were included in the group of medical buildings, but the better service to the student body, due to its easy accessibility and to the fact that in it students are less apt to feel that they will be used for teaching purposes or be treated by medical students, will more than justify the additional expense.

At present in Pillsbury Hall a medical and a dental dispensary and an infirmary of twenty-five beds are maintained. In conjunction are an operating room, a laboratory, a small x-ray and fluoroscopic equipment, and a pharmacy. On the agricultural campus a separate building was assigned to the Students' Health Service and completely remodelled to suit its needs. In it we now have a very satisfactory out-patient dispensary and a hospital of forty beds, most of them in small rooms.

PHYSICAL EXAMINATIONS

The beginning of the physical examination of freshmen students at the University of Minnesota is deserving of special mention. Years ago, with little or no encouragement and with no assistance, Dr. L. J. Cooke, of the department of physical education for men, began to examine freshmen. His other duties were more than sufficient to occupy his time, but believing in the importance of physical examinations he kept at them and during the year personally examined each one of the freshmen men. From this beginning the progress has been gradual until now every student entering the University or the University High School must have as part of the requirements for matriculation a physical examination. If a student first enters the University High School, a second examination is required when he enters the university proper. An additional examination is required of those students who enter the medical school and another is given at the beginning of the third year in medicine. Furthermore all athletes who compete in intercollegiate sports are required to have an examination at the beginning of each season, and every student who desires a locker in the gymnasium must have a medical inspection and an examination if his previous record shows any indication for it.

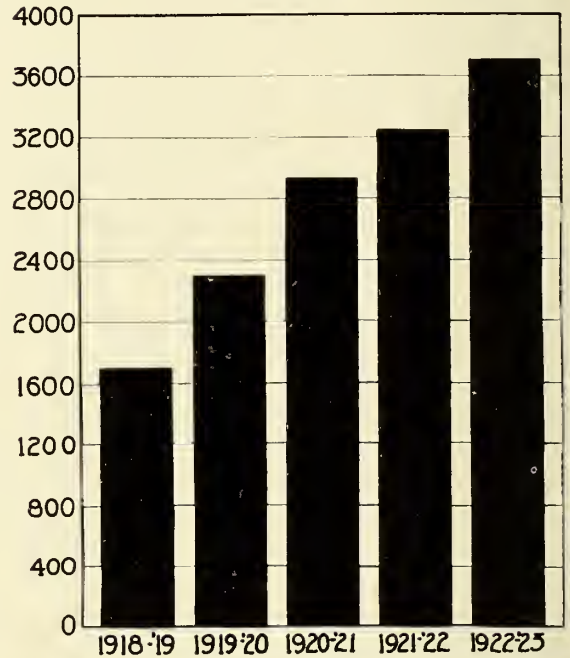
These physical examinations are extremely exhaustive, comprising, in addition to a careful history of past illnesses, complaints and family tendencies, blood pressure readings, reclining and standing; pulse rate before and after exercise; vital capacity; height, weight and chest circumference measurements; general orthopedic inspection; examination for hernias, goiters, venereal disease, etc.; visual and hearing tests; eye, ear, nose and throat examinations; physical examination of heart and lungs; dental examinations; urinalyses; Schick tests; nose and throat cultures; Dr. Larson's precipitin test for tuberculosis—the so-called "ring test"; and smallpox vaccination of all students who need vaccination and who do not flatly refuse it. Upon the completion of an examination one of the members of the staff sums up for the student the findings recorded, advises him as to any medical or dental care that he needs and gives him a classification on the basis of his physical condition. A card index is then made of those students who showed any of the more serious defects and during the year these students are called

back for re-examination. A discussion of the results of these examinations would be interesting, but space will not permit of it at this time.

MEDICAL AND DENTAL SERVICE

The Health Service maintains an out-patient dispensary for students at which one or more physicians are in attendance at all hours of the day.

**DISPENSARY VISITS ON MAIN CAMPUS
PER 1000 REGISTRATION OF COLLEGIATE GRADE**



To this dispensary students are encouraged to come upon the first appearance of symptoms of illness, the prevention of disease being the primary purpose of the service. The student who comes to the dispensary is examined, given immediate treatment if any is indicated, and advised as to what he should do. If his condition indicates that he should remain in bed, he is directed either to go home to bed and call his family physician or to enter the students' infirmary. At the infirmary the student is cared for until he can return to classes, or, if his illness happens to be a prolonged one, until he can be removed to his home or to a private hospital. A student who becomes ill at his room will be visited once by a physician from the Health Service, but for prolonged treatment it is necessary that he enter the infirmary or call a private physician.

A dental clinic of six chairs was recently added

to the Health Service dispensary. Here dental examination, prophylaxis and reparative work are made so easily available that no student should neglect his teeth.

During the school year 1922-23 students made 35,654 visits to the Health Service dispensary (of these probably ninety per cent would never have reached a physician in private practice); 861 students were admitted to the infirmary and stayed on the average just 3.7 days; 578 calls were made upon students at their rooms; and 6,233 visits were made by students to the dental clinic.

THE CONTROL OF COMMUNICABLE DISEASE

In universities located in large cities and having a large percentage of their students living at home, as is the situation with the University of Minnesota, the control of communicable diseases is extremely difficult. Many precautions, which would be unnecessary were the university an isolated community, must be served. In general the routine is as follows: (1) the careful examination for communicable diseases of all students who come to the Health Service dispensary; (2) isolation of all students with symptoms suggestive of a contagious disease; (3) quarantine of all cases or suspected cases of contagious diseases; (4) daily observation or isolation of close contacts; and (5) inspection of all students who have been absent from classes on account of illness and wish to obtain excuses for the time missed. By this last precaution alone we were able during the past year to identify and exclude from classes one case of open pulmonary tuberculosis; two cases of smallpox; one case of diphtheria; one case of scarlet fever; numerous cases of acute follicular tonsillitis, etc.

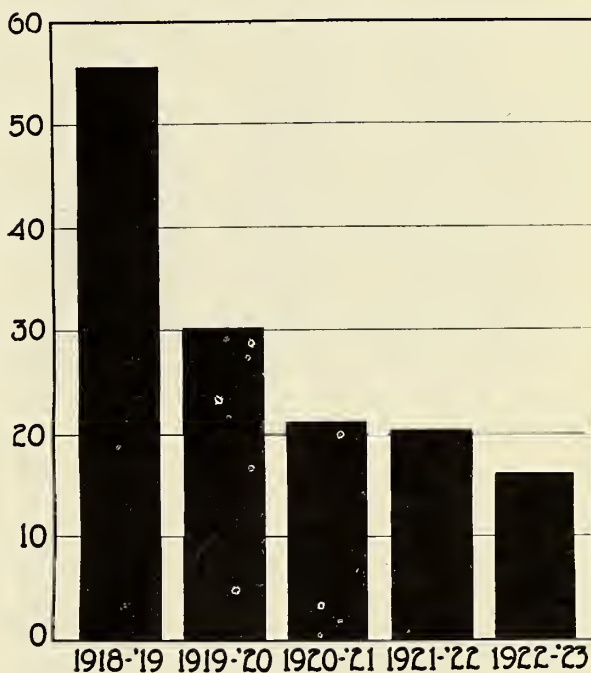
POLICIES

The policies which are followed by the Students' Health Service have been formulated to provide for the students the best possible health supervision; to make available to them adequate dental care; to teach them to seek medical care whenever such care is advisable; and to interfere as little as possible with the private practice of physicians in the vicinity of the university. The prevention of diseases, the correction of defects, and the practical health education of the student body, are the paramount aims of the service. To make possible the accomplishment of these aims, however, a certain amount of general and specialized treatment of

disease is necessary. Students must have confidence in the institution and learn that it has a service to render them; otherwise they will not seek its advice at the time most important for the prevention of disease.

Upon the completion of his physical examination, each student is instructed as to any defects or abnormalities which are discovered and advised to seek the necessary medical or dental care. Each year, as a result of this advice, many students go to practicing physicians for further examinations or for treatment. Others who are working their way through school or who live away from

**HOSPITAL PATIENTS
PER 1000 DISPENSARY VISITS**



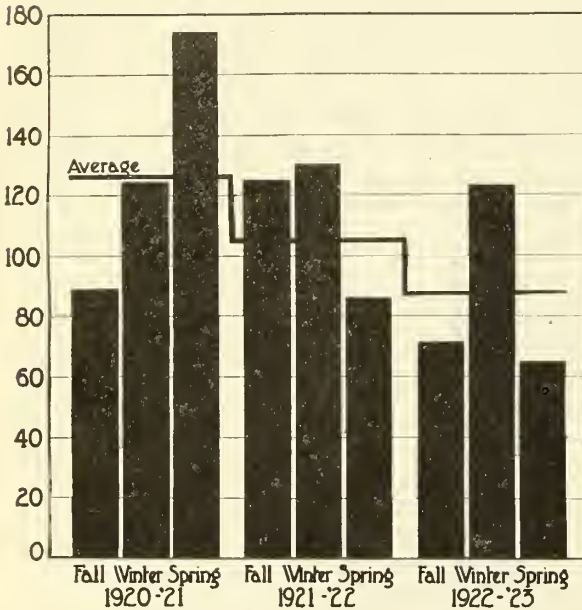
the Twin Cities return to the Health Service for further care. During the school year students who visit the Health Service dispensary are examined and advised as to their conditions. If they live in the Twin Cities and need further care, they are advised to return to their homes and call their family physicians. If a student needs an operation, other than an emergency, and can afford to do so, he is advised to go to a private hospital and call a private physician. Students with prolonged illnesses who are admitted to the infirmary are transferred to their homes or to a private hospital as soon as their conditions permit. By observing

these policies it has been possible to gain the confidence and support of the student body without infringing upon the physicians in private practice.

MAINTENANCE

As part of his tuition each student pays a health fee of two dollars per quarter, six dollars for the school year. From these fees sufficient funds ac-

**HOSPITAL DAYS, MAIN CAMPUS,
PER 1000 DISPENSARY VISITS.**



crue to pay the salaries of the staff, exclusive of dentists, and to cover most of the basic supplies and equipment. Students who receive services that entail extra expense to the institution are expected to pay on a cost basis for such services; for example, a charge for board and laundry of two dollars per day after two days is made to students confined to the infirmary; drugs are dispensed on a cost basis; x-rays are charged at cost and an operating room fee of ten dollars is charged for a major operation and one of five dollars for a minor operation. These charges are made to all students who receive such services, but a special provision makes it possible for the dean of student affairs to cancel the bills of especially deserving and needy students.

The dental department is required to be entirely self-supporting. To do this the charges for dental work are adjusted so that they will just cover salaries, materials, supplies, and depreciation on equipment.

ACCOMPLISHMENTS

It is frequently difficult to affirm with certainty that a particular form of treatment was responsible for a patient's recovery or that a certain preventive measure brought about the decline of an epidemic. Similarly in such work as the Health Service is carrying on it is difficult to measure accomplishments accurately. Before the establishment of the Health Service there was no accounting made of time lost because of illness nor was any record kept of even the serious illnesses among the student body, so nothing is at hand with which to compare present figures. A rough general comparison, however, can be made of the five years during which the Health Service has been in operation by comparing the following charts.

These charts show a progressive increase in the use which students are making of the dispensary and a corresponding decrease in the percentage of these who are sick enough to be sent to the infirmary. The decrease in the ratio of hospital days to dispensary patients is also significant.

Such figures as these can show definite accomplishments but they can never tell the whole story. The number of boys and girls who, except for the protection afforded, would have contracted communicable diseases, the amount of invalidism prevented by discovering chronic diseases in their incipency, and the lives saved by prompt medical surgical treatment will never be known and cannot be estimated. But even if we could have all of these accomplishments carefully itemized and tabulated we would still not have reached a sum total of the results of the work. One of the most important phases of the work would still have been overlooked. That is the educational phase. Certainly practical health education is one of the greatest opportunities of the service and one which is constantly emphasized. These thousands of students, most of whom have never before had a physical examination, are shown the value and the importance of periodic physical examinations and are taught to appreciate and to seek medical service whenever they become ill. They are vaccinated against smallpox and given Schick tests and they learn the value of these preventive measures as they would never learn them from formal instruction. The results which will accrue from such phases of the work one can never measure but every observer is convinced that they will be even greater and more far-reaching than the immediate and more tangible accomplishments.

PRESIDENTIAL ADDRESS

Minnesota State Sanitary Conference

November 2, 1923

GEORGE S. WATTAM, M.D.

Warren, Minnesota

In being permitted to address you today in the rôle of your presiding officer, I feel that I am accorded an unusual privilege and an honor most sincerely appreciated.

In accepting this trust at your hands, I assume the responsibility and the difficult task of endeavoring to contribute something that may be of interest and of value to those in attendance, and, through you, benefit the cause that we represent; but I promise not to weary you by a lengthy discourse, nor by quoting of tiresome statistics. The office of the State Board of Health, in an untiring effort to make this meeting a success, among other things, has provided, in concise form, a sheet giving statistics which I wish to commend to you for thoughtful perusal. It is worthy of careful analysis.

Many of you coming here to participate in this work do so at a sacrifice that can only be recompensed by the personal satisfaction of feeling that you are adding something to the welfare of your fellow citizens in assisting in solving some of the problems of modern sanitation; and, in behalf of the State Board of Health and the officers of this conference, I welcome you and your co-operation in the business of this session.

At this time we are in the midst of a financial distress and a mental unrest that history tells us is a logical sequence of all great wars; and when we try to give serious thought to estimating the huge loss of life, the destruction of property, and unreckoned misery which years of turmoil in Europe brought to the whole world, we are lost in wondering how so much of happiness and well being could have been preserved to the citizens of these United States. "Every cloud has a silver lining," and while we cannot replace the inanimate wealth so recklessly destroyed, nor the millions of lives so wantonly sacrificed, yet we have this consoling thought: Out of the chaos emerged a wealth of sanitary knowledge and a manifold increasing interest in all problems relating to health and the preservation of life.

We can, therefore, while reviewing with satisfaction the results of past endeavors to curtail disease,

look hopefully into the future for brighter prospects of attaining to the ideal. New agencies for the sale of sanitary knowledge are in the field, inspired on the one hand by a greater interest man now has in the welfare of his fellow man, and on the other by undeniable evidence that freedom from disease is an essential factor in material prosperity.

"Ill fares the land, to hastening ills a prey, where wealth accumulates and men decay." Influenced by the spirit of this thought of Goldsmith in the eighteenth century, our great employers of labor, controllers of wealth, are recognizing that accident and disease take an enormous unnecessary toll, and that it is cheaper to prevent than to cure.

The great insurance companies, powerful manufacturing corporations, believing it to be a good investment, are freely giving thought and money to modern sanitation, and our nation and state are appropriating, in increasing amounts, to assist in combating unnecessary disease. That most splendid and beneficent organization of historical mention, the American Red Cross, seeking new fields for its various activities following the recent war, turned a portion of its powerful influence for good into the hopper of better health. Churches, fraternal and business organizations, too numerous to mention, are all lending a helping hand, and it is an inspiration for all engaged in this cause to know that health work done in the past has not been in vain. In fact, if we but recall the havoc that communicable disease has caused in the past, we have every reason to view the future with optimism.

The Metropolitan Life Insurance Company tells us that a lessened death rate since 1911 saved that company nearly twelve million dollars in the year 1922; and we are also told that in the past thirty years twelve years has been added to the life of civilized man by modern methods of disease prevention.

Typhus fever, yellow fever and cholera, that from time to time scourged these United States, have been banished for good, and bubonic plague has never been able to gain a foothold in this country. Malaria and hookworm, so recently strong factors in causing ill health and poverty, are facing extermination.

Turning to our own State of Minnesota, we have every reason to be proud of the record made by our State Board of Health and its official and non-official auxiliaries.

Our State Board of Health, beginning its work

in 1872 on a petty sum of \$500.00, is now receiving an annual appropriation of \$145,500.00, or two hundred and ninety-one times the amount allotted for this splendid purpose at its inception some fifty years ago. In addition to this, the state and county sanatoria for the care of patients having tuberculosis are costing the State of Minnesota \$242,000.00 annually, making a gross amount of \$387,500.00. This appears like a very large sum to many members of our state legislature when we appeal to them once in two years for necessary financial assistance. Indeed, it is a large sum of money, and we may well ask: Is Minnesota justified in making this expenditure? Let us see!

The Division of Vital Statistics of the State Board of Health tells us that had the same death rate prevailed in 1922 that did in 1871, we would have had 5,538 more deaths in 1922 from five diseases, viz.: smallpox, tuberculosis, scarlet fever, diphtheria and typhoid. A saving of 5,538 lives in one year in only five diseases. Estimating the value of each human life saved at \$100.00, or the price of a fairly good cow, and at the end of the year we have returned to the State its \$387,500.00 and interest at 42 per cent. A pretty good investment! But if to this we shall add the saving of a decreased death rate from pneumonia, measles, whooping cough, diarrhea and other preventable diseases of childhood and youth, we will probably have saved a sum nearly equal to above amount, which is all "pure velvet." In addition we should add the cost of care of the sick, loss of time, and expense of burial—a mathematical problem that I have not had the time to solve. Yes, a saving of probably more than 10,000 lives annually to the State at an increased tax burden of fifteen and one-half cents per capita (one dish of ice cream for each). However, there is little need to consider this question from the standpoint of financial expediency.

The suffering and poverty engendered by disease

appeal so forcibly to our better natures that the cost of remedial measures becomes a secondary consideration, while the interest man now has in the welfare of his fellow man is sufficient incentive for welfare work that is seeking the subjection of preventable disease.

That we have not yet reached the limit of possibilities for the prevention of disease is being constantly demonstrated. A striking example of what may be accomplished has been recently shown by the Metropolitan Life Insurance Company at Thetford Mines, in Canada, where, beginning in 1921, by a systematic and well-planned campaign by a staff of nurses to lessen infant mortality, the death rate for infants was lowered over 50 per cent in two years.

Notwithstanding all that has been accomplished, it is estimated that the loss from preventable disease in the United States still reaches the enormous total of three billion dollars annually, while that from lost wages due to illness alone is greater than the total value of the wheat crop of this country. So there is plenty of work left and need for self-sacrifice on the part of all who feel that they may lend a helping hand to save a brother or a neighbor from impending danger, and in thus helping others, incidentally help themselves.

That the death rate from tuberculosis in this state is now only slightly more than one-half; of infants under one year about two-fifths; that from diphtheria only one-third; from scarlet fever only one-sixth; and typhoid fever about one-twenty-eighth that of a few years ago is surely enough reward for the few hours spent each month by volunteers enlisted in the work of public health and sanitation in Minnesota.

So we gather here today to pledge our aid in this good cause, sharing one with another and with the splendid pioneers of bygone days the credit of having made Minnesota one of the healthiest states of this Union.

APPARENT DEFORMITIES OF THE PILLARS OF THE FAUCES, SEEN AFTER AN IDEAL TONSILLECTOMY*

F. J. PRATT, M.D., F.A.C.S.

Assistant Professor of Ophthalmology and
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University of Minnesota

Minneapolis

This paper deals only with throats that have had tonsillectomies where no muscle tissue has been removed.

The cause of apparent deformities in the pillars of the fauces is due to anatomical variations in their structure.

"The palato-glossus is a small, fleshy fasciculus, narrower in the middle than at either extremity, forming, with the mucous membrane covering its surface, the anterior pillar of the soft palate. It arises from the anterior surface of the soft palate on each side of the uvula, and, passing downwards, forwards and outwards in front of the tonsil, is inserted into the side and dorsum of the tongue, where it blends with the fibres of the stylo-glossus muscle. In the soft palate, the fibres of this muscle are continuous with those of the muscle of the opposite side.

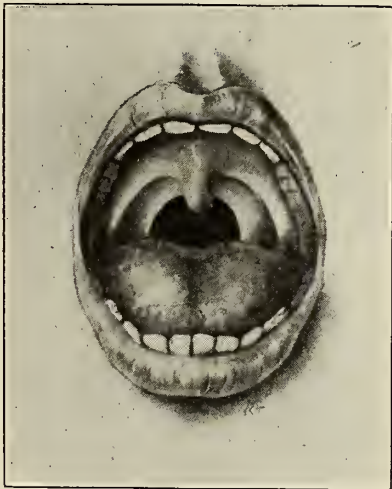


Fig. 1. Normal pillars.

The palato-pharyngeus is a long, fleshy fasciculus, narrower in the middle than at either extremity, forming, with the mucous membrane covering its surface, the posterior pillar of the soft palate. It arises from the soft palate by an expanded fas-

ciculus, which is divided into two parts by the levator palati. The anterior fasciculus, the thicker, lies in the soft palate between the levator and tensor, and joins in the middle line the corresponding

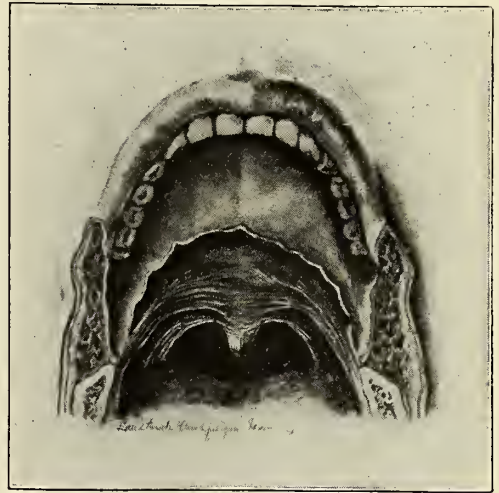


Fig. 2. Muscles of the pillars.

part of the opposite muscle. The posterior fasciculus lies in contact with the mucous membrane, and also joins with the corresponding muscle in the middle line, passing outwards and downwards behind the tonsil. The palato-pharyngeus joins the stylo-pharyngeus, and is inserted with that muscle into the posterior border of the thyroid cartilage, some of its fibres being lost on the side of the pharynx, and others passing across the middle line posteriorly, to decussate with the muscle of the opposite side."

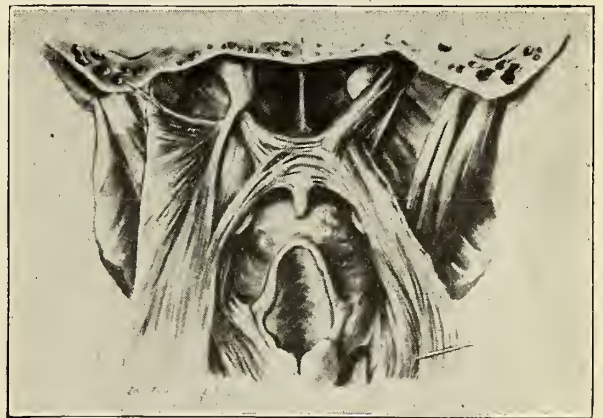


Fig. 3. Muscles of the Posterior pillars from behind.

An ideal throat has large muscular pillars, the anterior pillars about one-third the size of the posterior pillars.

*Presented before the annual meeting of Minnesota State Medical Association, St. Paul, October, 1923.

The variations are as follows:

1. Large muscular posterior pillars and thin anterior pillars. This is the most common variation. (Fig. 4.)

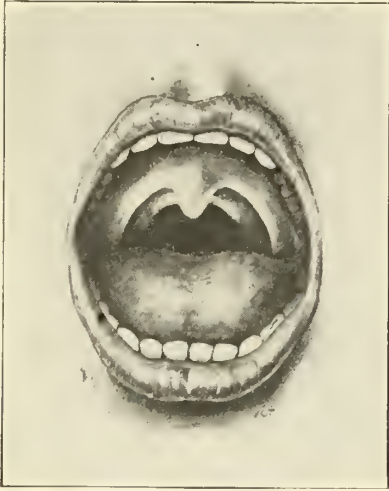


Fig. 4

2. Large muscular anterior pillars and small posterior pillars. The anterior pillars stand out well; the small posterior behind the anterior, at first glance, look as though they had been removed. (Fig. 5.)

3. A large muscular posterior pillar and a thin anterior pillar on one side and a large muscular anterior pillar and a thin posterior pillar on the other. (Fig. 6.)

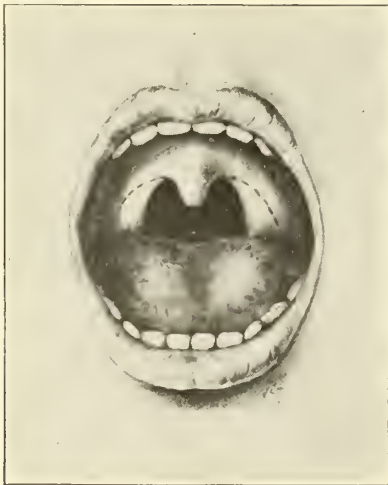


Fig. 5

4. Fairly large anterior and posterior pillars, but the posterior pillars one-third to one-half way

down blend into the muscular wall of the pharynx. (Fig. 7.)

5. The pillars on one side normal, but on the other side the posterior pillar one-third to one-half way down blends into the muscular wall of the pharynx. (Fig. 8.)

6. Both anterior and posterior pillars narrow and contain a small amount of muscle tissue. (Fig. 9.)

7. The pillars on one side normal, but on the other side the posterior pillar comes off high up behind the anterior pillar. (Fig. 10.)

The ideal pillars are generally found in the patients with large throats and tonsils of medium size.

The pillars in the throats of patients with large tonsils tend to be small; whether the large tonsils cause small pillars, or small pillars large tonsils, I am unable to say.

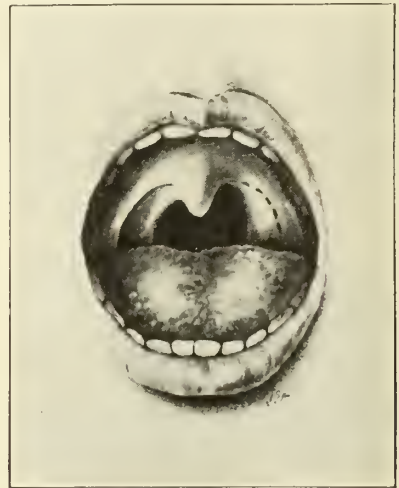


Fig. 6

Thin pillars or pillars with small amount of muscle tissue tend to collapse after a tonsillectomy, as there is not enough muscle tissue to hold them out, but plainly show if the patient gags.

A careful examination of a throat before a tonsillectomy will tell you just the kind of a throat to expect after a tonsillectomy, providing the muscle tissue has not been injured during the operation.

DISCUSSION

WILLIAM R. MURRAY, Minneapolis: The anatomical description of the muscles which form the faucial pillars and the illustrations shown by Dr. Pratt demonstrate very nicely the variations which may occur in these structures, and when these anatomical differences exist, we expect to get a

somewhat different post-operative appearance in the fauces after tonsillectomy than we would have if the muscular structures composing the pillars were of the usual development and symmetrical on both sides of the fauces.

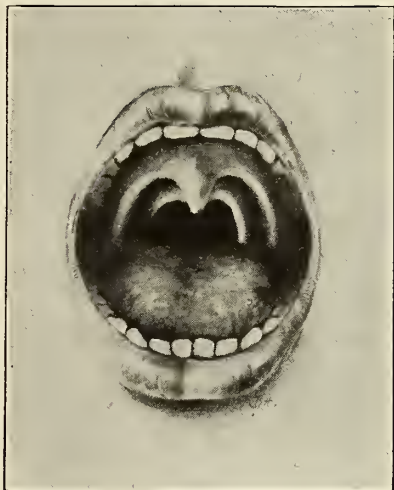


Fig. 7

I believe that these differences in the muscular development are more apparent than real in so far as they affect the ultimate appearance of the fauces after a tonsillectomy, and the appearance of the pillars and fauces immediately after operation is not always an indication of the ultimate appearance six months after operation.

There are other anatomical factors that influence the post-operative results of tonsillectomy. The sinus tonsillar is may be exceedingly deep and may extend high up into the soft palati above the junction of the anterior and posterior pillars and the upper lobe of one tonsil may extend

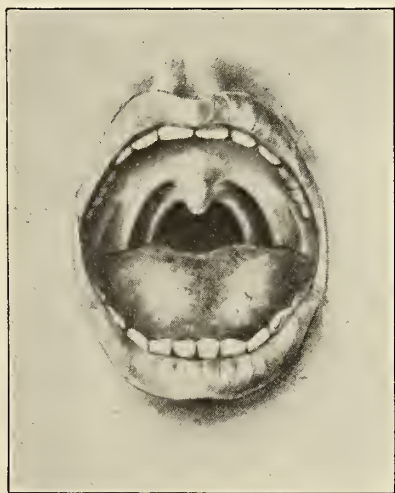


Fig. 8

much higher than the upper lobe of the opposite tonsil, in which case there is an asymmetry in the appearance of the pillars immediately after operation. This, however, is not

a deformity and later after the healing process is complete this asymmetry usually disappears.

Sometimes the anterior and posterior pillars are adherent to the tonsils so that in separating them from the tonsil a denuded surface is present on the posterior surface of the anterior pillar and the anterior surface of the posterior pillar. During the healing process the anterior and posterior pillars become drawn together and in some cases almost obliterated. This does not necessarily mean a deformity and gives no unfavorable results other than a temporary feeling of tenseness or drawing sensation which disappears.

The extent to which the external surface of the tonsil is attached to the muscular bed of the fossa may influence to an extent the post-operative appearance of the fauces. Usually the upper half of the tonsil is very loosely attached to the sinus tonsillar. The area to which the tonsil is firmly attached to the fossa varies greatly and sometimes extends to the borders of the anterior and posterior pillars. In these cases there will be greater obliteration of the fossa and pillars following the healing of the wound.

The presence of a well developed plica triangularis may influence the post-operative appearance, as the plica is removed with the tonsil.

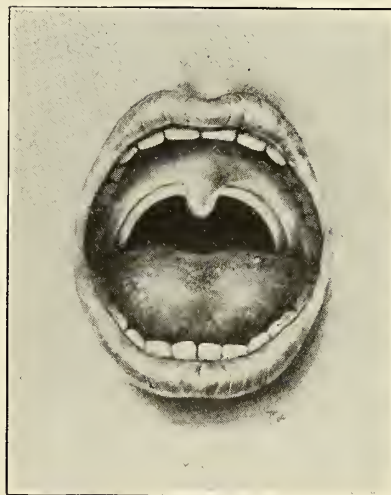


Fig. 9

The immediate, and sometimes the final, post-operative appearance, then, may be influenced by anatomical and pathological conditions that may be present previous to operation and the so-called apparent deformities referred to by Dr. Pratt are not deformities, and cause no unfavorable symptoms, if no operative injury has been done to surrounding muscle tissue.

DR. CARL L. LARSEN, St. Paul: I am pleased that Dr. Pratt used the word apparent because a great many of the deformities are more apparent than real.

While a perfectly performed operation is our aim and undoubtedly leaves the most ideal throat, I am convinced that there are many exceptions.

If the sinus tonsillar is deep and the tonsillar root extensive, the surface denuded by the removal of the tonsil

will include nearly the whole of the sinus even to the edge of the pillars. Here contraction of the cicatrix may pull the pillars so closely together that they appear to be and often are adherent.

There is actually no deformity but the pillars do not stand out with a distinct gutter between them, which is the ideal end result.

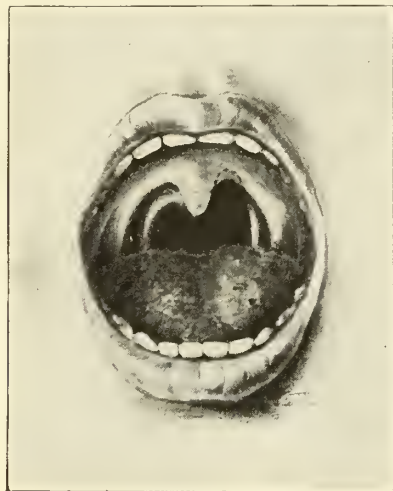


Fig. 10

Difference in the size of the tonsils, difference in the attachment, the arch of the palate or the tonsils being higher on one side than on the other, are conditions that frequently account for the difference in appearances of the

two sides and consequent asymmetry which is not the ideal looking throat.

Infection, too, plays an important part. The more infection the greater the cicatricial contraction and the greater tendency to agglutination of the denuded surfaces.

I am convinced that after tonsillectomy nothing should be done to interfere with nature's attempt at repair. I doubt the efficacy of gargles; they do no good, are often painful and frequently interfere with prompt healing.

I do not believe we can always tell beforehand just what kind of a throat we are going to have following tonsillectomy. The separation of the anterior pillar by sharp dissection with knife, scissors or Sluder, the remaining dissection and removal of the tonsil with a minimum amount of traumatism is undoubtedly the ideal operation, but unfortunately, no matter how skillfully performed, the ideal looking throat is not always attained.

DR. F. J. PRATT, Minneapolis (closing): It is impossible to tell exactly what kind of throat you are going to get because some people scar more than others, and naturally there will be more contraction. What I meant was that we can get an idea of about the kind of throat we are going to have by the amount of muscle tissue there is in the pillars. The thing that brought this paper to my mind was: Why was it that after doing a tonsillectomy apparently the same way every time, the throats were not all ideal? Some had what we call nice normal throats and others had not. That led me to make a study of these cases, and I have been keeping track of them for a number of years. I have seen all these different variations, and I came to the conclusion that they were anatomical. There have been plenty of papers on deformities of the throat but nothing has been said about anatomical variations.

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APRIL, 1924

No. 4

EDITORIAL

Periodic Health Examinations

The human body is a wonderful machine, but how woefully mistreated through carelessness and ignorance. There were times when a man would deliberately mutilate his body in the name of religion. Ideas, fortunately, have changed. It is being more and more realized that a healthy body is more likely to result in a better functioning brain and a happier individual.

The Britisher holds his athletic games indispensable. Such Americans as Roosevelt, Taft and Coolidge have realized the necessity of taking time out of a crowded day for attention to physical needs. Cyrus Curtis of Curtis Publishing Company fame is a good example of a busy man not realizing the importance of taking care of himself until he was turned down for life insurance some twenty years ago. He is also a good example of

how life may be extended and be made even more efficient by devoting a little attention to bodily needs.

The purpose of periodic health examinations is not only to discover signs of early disease, which may be amenable to treatment, but to detect errors in habits, which are either interfering with good health or are likely to cause trouble in the future. A business man was once heard to remark that in his opinion if the average young man was not a success at his occupation, whatever it might be, there was generally some bad habit to account for it. This is the sort of thing that a periodic health examination should ferret out and it is apparent that such an examination must of necessity be quite different from the ordinary consultation. It is quite evident that the idea of such examinations must be sold to the profession if they are to amount to anything. Perhaps the best way of convincing any "doubting Thomas" would be to have him make such examinations. It would not be long before he would be impressed with the number of individuals with diseased tonsils, carious or abscessed teeth, whose chest and waist measurements should be reversed, or who are using coffee or tobacco to excess.

The examination of supposedly healthy individuals is not entirely new. It is a common saying that the Chinese physician is paid to keep his patient well. Infants in infant welfare stations, school children and college students on entering an institution, workers at industrial establishments, life insurance applicants and policyholders commonly go through a more or less thorough overhauling. Many unsuspected abnormal conditions have been detected by such examinations.

The present move for periodic examinations originated among the laity, which is as it should be. Numerous organizations, some supervised by non-professional men, have sprung up to satisfy and augment the demand. The Life Extension Institute of New York, headed by Dr. Eugene Lyman Fiske, is the largest and best known organization of this sort. Begun with a humanitarian motive, it has proven its worth in dollars and cents to many insurance companies and bids fair to continue its already rapid growth.

The National Health Council, composed of a number of nation-wide associations such as the Red Cross, Public Health Service, National Tubercu-

lois Association, Woman's Foundation for Health, et cetera, is carrying on a nation-wide campaign for health examinations and has adopted the slogan "Have a Health Examination on Your Birthday."

Realizing the growing demand for these examinations, our national organization gave the idea its approval at San Francisco last summer, and the Council on Health and Public Instruction of the American Medical Association has prepared an outline form for use by physicians. In the *A. M. A. Journal* of May 12, 1923, the form is thoroughly explained in an article by Dr. Haven Emerson. Reprints of this article and examination forms may be obtained from the *A. M. A.* headquarters.

It has been suggested that each county society take up the proposition of periodic health examinations at one of its meetings. A thorough discussion of the subject based on Dr. Emerson's report should clear the atmosphere. Whether public announcement that the local physicians are prepared to give these examinations is made or not should be left to each county society to decide.

It is unquestionably desirable to have some form to follow to insure a methodical and thorough examination. The work will be greatly facilitated if the applicant makes out his portion of the blank in advance of the physical examination, which should preferably be by appointment. The *A. M. A.* form insures thoroughness, which is fully as important in such examinations where there is often no clue offered to existing trouble as in ordinary consultations. Examinations of supposedly well individuals are, too, quite different in the matter of advice to be given regarding personal hygiene.

The medical advisor and particularly the general practitioner is the logical one to conduct these periodic health examinations. The examiner himself is in a far better position after personally examining and discussing the patient's habits to give valuable advice than anyone, even a medical man, in a distant city, providing, however, the examiner is in sympathy with the procedure and takes the trouble to give this sort of work the necessary thought.

The only reason these examinations are being carried on by anyone other than the family physician is because we have been slow to meet the situation. The demand exists. Are we as a profession going to meet it?

Doctor Amos W. Abbott—A Tribute

It is characteristic of every community to present certain outstanding figures. There is always to be found a minority who, because of special attributes, reach heights which are unattainable by the great majority of individuals. The medical profession is richly endowed with these outstanding figures. A favorable heritage plus a good fundamental education and an unceasing effort to obtain and apply knowledge are the essential assets which make it possible for certain individuals to achieve well-earned distinction.

Too often great men are unappreciated in their respective communities until after they have passed on. Too often, bouquets, both in a literal as well as a figurative sense, are withheld from those whose achievements merit the appreciation of those about them until they are no longer with us. Too often, do we fail to make known the fact that we are cognizant of the exceptional worth of outstanding personalities until after they have gone to their reward, when the knowledge of the esteem in which they were held can be transmitted to their survivors only.

Only occasionally does the realization of the honesty, integrity, character, personality and achievements of an individual present itself with such exceptional force to those who are familiar with his accomplishments that the offering of a befitting tribute is made while he is still among us and in a position to realize the esteem in which he is held by his confrères.

A delightful and unusual example of spontaneity in offering a well-deserved tribute took place at the Minneapolis Club on Saturday evening, March 1st, when an assemblage of about one hundred friends of Dr. Amos W. Abbott gathered to pay a tribute to this well-known surgeon upon the occasion of his fifty-fifth anniversary in the practice of medicine. At a dinner given in his honor his friends vied with each other in eulogizing him and showering him with felicitations. The fact that Dr. Abbott is still in possession of excellent health and virility with mental facilities as acute as those of the average man of fifty added zest to the occasion. His record in the Civil War, in which he took part while not yet of legal age, his achievements as a teacher in the medical school, his contributions to medical science, the indelible impression he has made upon the practice of medicine in the Northwest, his uni-

versal kindness, encouragement and direction of the younger members of the medical profession, and his loyalty as an American citizen, were dwelt upon by the speakers from various walks of life in a manner befitting his rank. Dr. Abbott and his family were made to realize the pinnacle upon which this nestor of medicine and surgery stands in this community.

With the modesty and diffidence which are characteristic of Dr. Abbott, he returned his thanks for the many words of appreciation offered by those present and in addition credited Mrs. Abbott and his faithful nurse, Miss Holmes, and others who have been associated with him, with being responsible for any success he might have attained. He further paid a glowing tribute to Messrs. O. C. Wyman, T. B. Janney and Wm. F. Dunwoody, the gentlemen who had so whole-heartedly donated large sums of money, thus making possible the establishment of the magnificent institution of which he is the head.

MINNESOTA MEDICINE and all of Dr. Abbott's acquaintances appreciate the fact that were it not for his remarkable achievements, his staunch and conscientious observance of the Golden Rule, combined with his sterling qualities and personality, these influential citizens would not have been inspired to donate so generously for such a worthy cause. We know that his example has been and will be a lesson to all other members of the medical profession and we hope that other citizens who are financially able to do so will see the necessity and righteousness of following the example of Messrs. Wyman, Janney and Dunwoody.

We take great pleasure in joining with Dr. Abbott's friends and admirers and adding our mite. Though not in measurable or tangible form—yet we would have him feel it is our sincerest wish to bestow upon him the greatest endowment within our power—our appreciation and love.

Minneapolis Health Exposition

In keeping with the idea that prevention of disease is far better than cure, the Hennepin County Medical Society will launch, from May 3 to 10, 1924, the first Health Exposition in this part of the country. Only five other cities have so far held such expositions. The medical society is the logical agency to manage such an activity, although numerous other civic and social organizations will take part.

The Exposition has chosen for its motto "Live a Little Longer." Education is the main factor in accomplishing this result. Prevention of unnecessary sickness, care of the sick, sanitation, ventilation, social science and kindred topics will be emphasized. There will be elaborate displays of all kinds, most of which will deal with medicine, surgery, dentistry, pharmacy, safety methods and other topics of interest to the general public. Lectures will be enlivened by entertainment features and motion pictures.

Eminent scientists from various parts of the country will be invited to Minneapolis for the week. The simultaneous holding of Minneapolis Clinic Week (May 6 to 9) should afford a double-header attraction for physicians and public alike.

COMMUNICATIONS

St. Paul, Minn.,
March 10, 1924.

TO THE EDITOR:

In compliance with our conversation of the other day, I am writing you as follows:

SIMPLE GOITER PREVENTION

Minnesota is in the goiter belt of North America. The prevention of simple goiter is of import to every person in the state and of special interest to the medical profession.

The story of the use of iodine as a preventative in the human has been most interestingly told by Marine and Kimball and the agricultural experiment stations of the Northwest have told the story in animal husbandry.

By addressing the Surgeon-General, United States Public Health Service, two interesting reports upon this subject may be obtained—the "Prevention of Goiter," Reprint No. 832 from the Public Health Reports, April 27th, 1923, and the Public Health Reports of January 11th, 1924.

We have for some time been trying to obtain some definite statistics as to the prevalence of simple goiter in Minnesota. Not being able to find any statistics already compiled, a survey was made of the sixth, seventh and eighth grades, corresponding to the ages of eleven to fifteen, of twenty-nine public schools in St. Paul.

We followed the classifications of Marine and Kimball of "Slightly enlarged, moderately enlarged and enlarged," slightly enlarged indicating the "palpable only" type. Our five medical inspectors were sent out to make this survey, one man doing a school with a nurse assisting. The findings were so startling that we had other medical inspectors go over the same schools to verify the results (they were not previously notified that the building had been surveyed). The second survey confirmed that of the first, the greatest difference being only five per cent.

Twenty-nine grade schools and two high schools were surveyed, the average findings being as follows:

GRADE SCHOOLS

	Number examined	With enlarged thyroid
Girls	2,608	73%
Boys	2,559	54%

CLASSIFIED AS TO DEGREE OF ENLARGEMENT

	Girls	Boys
Slightly enlarged	41%	45%
Moderately enlarged	26%	11%
Enlarged	6%	2%

These figures seemed so astounding to us that we were in doubt whether to believe them. Of course, this classification is of gross character, but nevertheless valuable. As Marine and Kimball state, about 75 per cent respond to prophylactic iodine treatment.

HIGH SCHOOLS

In Humboldt High School, in a group of 235 girls, 73 per cent had enlargement and in a group of 150 boys, 58 per cent had enlargement.

In Central High School, in a group of 134 freshman girls, 78 per cent had enlargement and in 127 freshman boys, 45 per cent had enlargement.

CLASSIFIED AS TO DEGREE OF ENLARGEMENT

	Girls	Boys
Slightly enlarged	39%	44%
Moderately enlarged	34%	1%
Enlarged	5%	0

Second in point of interest to the large average percentage of enlargement of the thyroid, is the variable distribution throughout our city. For instance, in our First Ward, the average incidence in girls is about 90 per cent; in the Eighth Ward the school average is 51 per cent; in a school in the Tenth Ward 47 per cent and another school in the Tenth Ward 46 per cent. There were many other variations in distributions of this character and a study is being attempted to analyze these differences. It is to be remembered that the same physician surveying a high percentage school also reported low percentage schools.

OTHER CITIES

We were able lately to obtain a compilation from the Minnesota State Board of Health of surveys made in five of the smaller cities, namely, Eveleth, Gilbert, Hibbing, Grand Marais and St. Peter. The total findings were as follows:

Girls with enlarged thyroid.....	70.4%
Boys with enlarged thyroid.....	42.6%

In one place children below the age of ten years were surveyed and, of course, this brought down the total average.

CAUSES

The great variation in the prevalence of goiter in different districts of the city is difficult to analyze. The economic

conditions are a factor, as well as the national food habits and the local environment.

We believe that diet is the principal factor. In the First Ward, we have a Swedish population that is extremely local in its habits. For several generations they have lived in this locality. The food habits have changed since leaving the Scandinavian peninsula. Our investigation shows that the principal diet consists of coffee, bread, cake, meat and potatoes. These foods lack the iodine content and may be one reason why they have a large percentage of thyroid enlargement.

In districts where economic conditions prohibit the purchase of vegetables throughout the year, and where the districts are so congested that gardens are not grown, we also find a large percentage of thyroid enlargement.

In other districts where economic conditions are not so severe and a larger amount of southern grown vegetables are purchased with a large iodine content, we find less enlargement of the thyroid.

The possibility of atmospheric iodine must be considered. McClendon states that the burning of coal disseminates iodine in the atmosphere.

FUNCTION OF IODINE

Marine explains the physiological action of iodine as follows: "Starting with the normal thyroid there is a decrease in the iodine store and a corresponding decrease in the stainable colloid. If the iodine store falls below 1 mg. per gram of dried gland, active hyperplasia begins. If the iodine deficiency is not met, the thyroid glands will go on to cellular degeneration and atrophy, or where the iodine deficiency is met, it returns to the colloid or resting stage. This is the nearest to normal that an active hyperplastic gland can come and function normally.

"Experiments show that the thyroid will start to enlarge as soon as the iodine content gets below one-tenth of one per cent of the total amount of dried gland tissue. When the iodine content of the thyroid gland in pregnant animals is deficient, the young are born with goiters, while on the other hand this tendency toward goiter formation in the young could be prevented by maintaining a normal iodine content in the mother's thyroid. (1) Iodine is necessary for the normal function. (2) The iodine content varies inversely with the degree of hyperplasia. (3) The percentage of iodine present in individual thyroids is variable, but there is quite constant minimum percentage which is necessary for the maintenance of normal or colloid gland structure. If the iodine content falls below one-tenth of one per cent, active hyperplasia begins. Also, iodine is necessary for the physiological activity of the thyroid secretion."

Simple goiter or the simple enlargement of the thyroid gland is common in certain portions of the globe. The knowledge of the simplicity with which the majority of thyroid disarrangements could be prevented is so important that everybody must know what to do and how it must be done.

Goiter is one of the most insidious diseases which attack man and animals and the easiest to prevent.

Under the classification of simple goiter, we now include all those thyroid enlargements in man and animals which were formerly designated as endemic, epidemic, sporadic and physiologic or adolescent goiter.

Practically all of the preventive work has been confined to the adolescent age. There is little, if any, danger of aggravating toxic thyroid types with the small amount of iodine administered.

It must be remembered that the purpose of the administration of iodine among the adolescent is for prevention and not treatment. Those having a thyroid that requires treatment should place themselves in charge of a physician. We do not believe in advising adults to take iodine for enlarged thyroid unless they are under observation of a physician.

WATER SUPPLY

Iodizing the water is an expensive procedure, due to the large amount of city water supply for other than drinking purposes. There is a possibility of iodized water aggravating the toxic goiter; there is also the danger of iodized water interfering with certain commercial enterprises,—such as bakeries, laundries, etc.; in some places this fact has caused considerable opposition.

The States of Wisconsin, Montana and Michigan, through their agricultural departments, issue a vast amount of printed matter for the prevention of thyroid difficulties in fish and livestock. These publications are usually issued under the title of "Hairlessness" and "Goiter" or "Hairless Animals."

Early in 1918, in Switzerland, long known to be the most goitrous country in the world, a campaign to eradicate goiter was begun in the schools of Zurich under the direction of Dr. R. Klinger. It was found that in some of the schools 100 per cent of the children were goitrous.

The governing authorities of the different cantons of Switzerland realized how readily and easily the incidence of goiter could be controlled. Measures were adopted for an energetic campaign to stamp goiter out of the country. The Canton of St. Gall, Berne and Zurich have for more than three years given treatment to the school children with striking results. The figures show that before the treatment was inaugurated goiter occurred in 61 to 97 per cent of all children. After treatment, the percentage had fallen to 27.5 per cent.

CONCLUSIONS

1. The importance of local surveys in Minnesota has been shown and more should be made.
2. Enlarged thyroid is prevalent among the adolescent and radical steps towards its prevention should be taken at once.
3. The most practical and effective method is the weekly administering by mouth of small quantities of iodine preparations.
4. Simple goiter is easy of diagnosis and is the easiest known disease to prevent.

Very truly yours,

E. A. MEYERDING, M.D.,
Director of Hygiene.

La Crosse, Wis., Feb. 9, 1924.

MINNESOTA MEDICINE,
Gentlemen:

Have read with much interest your editorial concerning the optometrists and their professional standards, reprinted in the *Optometric Weekly*. The editorial is well handled. But it reminds me of the Minnesota Swede that poked fun at the Wisconsin German because the Wisconsin German spoke broken English, and we laughed at the broken English of the Swede, and he got mad.

Reform should begin in one's home before we attempt to go into the world and reform the world. The Jew says that the Golden Rule is a good rule and ought to be obeyed, but he is a Jew and does not believe in Christ.

If I interpreted the editorial, the mind that wrote it had the purpose of having us believe that *the* mind was one mind in authority.

When the editorial was written the writer did not have before him the fact and truth that physicians and surgeons, with the title M.D. added, run cards in their local papers that read like the ones I have inclosed. So may we ask, if it is these men that the editorial refers to when it speaks of the medical oculist. Are these physicians oculists?

Suppose members of the medical profession began in their own ranks and reformed themselves and made it impossible for any doctor with the title M.D. to assume the title oculist until he had earned that which you propose the optometrist should earn before he examines eyes and fits glasses.

Is not the correspondence between the physician and the editor of a medical journal significant as it relates to the reform that you have proposed for another? Of course many laymen do not know that such things exist among the medical profession.

Nearly every country doctor of medicine has a trial case today, and when he cannot find a surgical job he gets out the trial case and sells them glasses. Ask any oculist what he thinks of it.

The right to confer the title doctor rests with the people. A charter is granted any college to confer its titles by the people. People have addressed me as "doctor" for years and years, and only lately have I begun to use it in my advertising. And everyone believes in advertising. Did you ever know of a doctor of medicine that refused to permit all the free advertising that he could get, that would help him become a Will or Charles Mayo?

The optometrist will be faithful to the people who employ him or the people will destroy the optometrist. No other organization can destroy the optometrist who does not practice medicine, and the courts of the country, that we honor, have rendered a decision that any man, doctor of medicine or otherwise, who examines eyes and fits glasses is not practicing medicine.

When I cannot produce normal vision for a person, I recommend that he go to his family physician, and when I note diseases of any kind I recommend that the person go to his family doctor. Then what happens in lots of cases? The person has listened to the family physician recommend that when the person gets his eyes fitted to glasses, he should go to the oculist and not back to the

optometrist. And the Jew says the Golden Rule is a good rule for Christians, but he is a Jew.

If an optometrist makes a mistake it is different than when a doctor of medicine makes a mistake.

The writer has been examining eyes and fitting glasses for over twenty years, and I offer and do refund money when I fail. Ever hear of a doctor of medicine refunding money when he fails? And I am just an ordinary optometrist, because I have not a good press agent or the money to hire one, but the people, whom I have learned to trust, will cleave to that which is right.

I hope that the doctors of medicine will read what is printed in the editorial and apply it to themselves, and I am glad the optometrists have the same privilege.

Very truly yours,

H. CLAY EVENSON.

P. S.—I know one of the finest surgeons of our city, who will fit you with glasses, and he does not assume the title oculist.

Editor's note: The editorial referred to appeared in the October, 1923, number of MINNESOTA MEDICINE. It is not our purpose to enter into a debate on this subject, but the above viewpoint of an optometrist is interesting and hits some vulnerable spots in the medical profession. For anyone to hold that all M.D.s are beyond criticism and all optometrists inefficient would be absurd. What is more, it is doubtless true that a well trained optometrist can fit a pair of glasses better than the average M.D. at graduation. There can be no argument, however, on the point that the medical graduate has a firmer foundation to build upon than the optometrist.

Obviously the weak link in our present stand in the matter of fitting glasses is the casual sort of work done by some of our regular doctors. Even at that, however, no one could say that a lot of jewelers and bungling opticians should be allowed to fit glasses, chiefly in order to sell them.

If the development of optometry were the result of a demand for a specialist in fitting glasses in a sparsely settled district where the M.D. was more occupied in the pursuit of the various other medical activities, we might feel differently about the situation. On the contrary, optometry has developed for the most part in the thickly settled districts where there is no paucity of oculists. The rank and file of optometrists advertise; the advertising oculist is the exception and as a rule is classed by his fellow practitioners as an outsider. Doubtless some M.D.s have felt forced to advertise by the advent of numerous advertising "specialists," just as the allies were forced to take up gas warfare, although not approving of it.

As intimated in the editorial, the optometrist is developing a professional sense but the medical profession has a twenty years' lead over the present optometrists. If the optometrists are in dead earnest, let them acquire all the current knowledge in existence pertaining to all phases of science having to do with the life work they have chosen. The public demands thorough education for those entrusted with the care of the teeth. Surely our eyes are fully as valuable as our teeth.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNEAPOLIS CLINIC WEEK—1924

The days for Minneapolis Clinic Week are May 6, 7, 8 and 9.

The first two days, May 6 and 7, will be devoted to *dry clinics* entirely. The following days, May 8 and 9, will be devoted to clinics at hospitals where perhaps some of the patients that are exhibited at the dry clinics will be operated in the wet clinics; or medical cases which are shown there will be demonstrated later perhaps by more suitable methods.

There has been some question as to the meaning of "dry clinics," and the plan of the Committee in charge is to have the entire attendance congregated in one meeting place (that to be selected later) where all the men may see the ambulatory or bed clinics that will be given on a raised platform and will be demonstrated by men who have been chosen for this special line of work. We do this with the expectation that many may get more from a dry clinic under these circumstances than a few may get from an operative or bedside clinic at a hospital.

Any man from outside the Twin Cities may send in his patient for a dry clinic demonstration if he so chooses.

Minneapolis Clinic Week is to be closely affiliated with the Minneapolis Health Exposition which will be in operation from May 3-12 at the Armory Building in Minneapolis, and where several phases of public health work, educational work related to public health measures, and commercial exhibits which are related to both, will be carried on.

It is expected in the Health Exposition that a large number of men will participate in the demonstrations at the various booths and during the clinical examinations which are to be given at the same time.

The Annual Banquet given by the Hennepin County Medical Society will take place on the evening of Wednesday, May 7th, at the Radisson Hotel, which will also be the headquarters for Minneapolis Clinic Week.

UNIVERSITY SHORT COURSE

The attention of the profession is called to the change in the plans for the short courses in postgraduate work to be conducted by the University this summer.

This year the courses will be condensed to two weeks instead of four in the hope that a larger number will enroll and take the full course.

The course in Medicine and Surgery will run for two weeks beginning May 26, 1924. The date previously announced in a circular postal card has been advanced to May 26, so as not to interfere with the American Medical Association meeting in Chicago, which begins June 9.

The course in Pediatrics and Obstetrics will be held in September, 1924.

The University has conducted these courses for the past four summers for a period of four weeks in the month of May. The course has been a general one in the past and the average attendance has been about thirty. Shortening the course and dividing it in two will, it is hoped, prove more practical to those interested.

TRI-STATE DISTRICT MEDICAL ASSOCIATION

Interstate Post-Graduate Clinic Tour to Canada, British Isles, and Paris in 1925 is now being arranged under the supervision of the Managing Director's office of the Tri-State District Medical Association. The time for leaving will be about the middle of May.

The tour will consume, approximately, two months' time and the total cost from Chicago and back to Chicago again will be less than \$1,000.00. This will include all clinic arrangements and admissions and all traveling expenses, except meals on Pullmans in America and tips on the ocean steamer. First-class hotels will be used everywhere and the ocean passage will be on the largest and finest of the new one-cabin ships.

Clinics are being arranged in Dublin, Belfast, Liverpool, Manchester, Leeds, Edinburgh, Glasgow, Newcastle, London and Paris and other points of clinical interest. The clinics will be conducted by the leading clinicians of these cities. The opportunity will be given, subsequently, to visit the clinic centers in other parts of Europe.

This tour is open to members of the profession who are in good standing in their state or provincial societies and their families and friends.

Sight-seeing programs will be arranged practically every day abroad, including the most scenic part of the countries visited, without extra cost.

On account of the great demand for reservations, applications should be made as early as possible to Dr. William B. Peck, Managing Director, Freeport, Illinois. Preference in the assignment of hotel and steamship accommodations will follow the order in which the applications are received.

AMERICAN DERMATOLOGICAL ASSOCIATION

The next annual meeting of the American Dermatological Association will be held in Minneapolis, June 5, 6 and 7, 1924, with headquarters at the New Lafayette club, where all papers will be given. A skin clinic will be given at the University Hospital in connection with the regular meetings.

Arrangements for the meeting are being made by the local members of the Association, Dr. John Butler, Dr. S. E. Sweitzer, Dr. Charles Freeman and Dr. H. G. Irvine, who, as a member of the Council, is acting as chairman.

AMERICAN SOCIETY OF CLINICAL SURGERY

Announcement has been received of the semi-annual meeting of the American Society of Clinical Surgery, which is to be held in Rochester, Minnesota, June 6 and 7, 1924.

RED RIVER VALLEY MEDICAL SOCIETY

At the annual meeting of the Red River Valley Medical Society which was held in Crookston in January, the following officers were elected for the coming year: President, Dr. W. H. Hollands, Fisher; vice president, Dr. Arthur Kahala, Crookston; secretary-treasurer, Dr. M. O. Oppegaard, Crookston.

STATE MEDICAL MEETING

The annual meeting of the State Medical Association will take place October 8-10, 1924, at St. Cloud. The program committee consisting of the chairman and secretary of the Surgical Section, Dr. A. C. Strachauer, Minneapolis, and Dr. V. C. Hunt, Rochester, the chairman and secretary of the Medical Section, Dr. E. L. Tuohy, Duluth, and Dr. C. N. Hensel, St. Paul, and the secretary of the Association, had its first meeting February 13. The various problems in the arrangement of a comprehensive program were discussed. It was decided to arrange a program similar to previous state medical programs, affording an opportunity for members of the Association to present subjects in which they are particularly interested and which will be of interest to the members. Members are invited to send in to the secretary of the Association, 402 Guardian Life Bldg., St. Paul, the titles of subjects they desire to present. It will of course be incumbent on the committee to pick and choose in order to make up a well balanced program. Titles must be in the hands of the secretary by *April 15*. Prompt notification of acceptance or rejection will be made about May 15.

THE MEDICAL FORUM

The Medical Forum of St. Paul held its regular monthly meeting Wednesday evening, March 5, 1924. After a dinner at the Saint Paul Hotel the following program was given:

1. Case Report. Pyo-nephrosis, treated by ureteral drainage. This interesting case was fully presented by Dr. E. H. Norris, who emphasized the possibilities and the success of this method of drainage, where other surgical intervention might be contraindicated. General discussion of the case was opened by Dr. F. E. B. Foley.

2. Practical Electrocardiography, with lantern slide demonstration. This subject was presented by Dr. H. E. Richardson, who emphasized the diagnostic, prognostic, and therapeutic aids given by this instrument of precision, the electrocardiograph, especially in cardiac irregularities and in the myocardial degenerative diseases of middle life. He urged a more general use by the medical profession of the information given by this instrument in the interest of more accuracy in the diagnosis and treatment of diseases of the cardio-vascular system. General discussion of the subject was opened by Dr. E. T. Herrmann.

The next meeting of the Medical Forum will be held at the Saint Paul Hotel, April 2, 1924.

W. R. SHANNON, President.

L. S. YLVISAKER, Secretary.

OF GENERAL INTEREST

Dr. J. V. Johnson of Duluth has moved to California.

Dr. L. Q. Greeley of Duluth has been doing some postgraduate work at Chicago.

Dr. F. D. Brandenburg, formerly of New Richland, is now located at Crystal Bay.

Dr. and Mrs. D. E. Seashore of Duluth spent the month of February at Miami, Florida.

Dr. T. N. Kittelson of Fergus Falls recently returned from a trip to Mobile, Alabama.

Dr. S. H. Boyer was recently elected president of the Professional Men's Club of Duluth.

Dr. and Mrs. L. D. Huffman, Rochester, are the parents of a daughter born February 11, 1924.

Dr. and Mrs. Tolbert Watson of Albany have returned from a trip through the western states.

Dr. and Mrs. C. E. Lum of Duluth have returned from a month's visit in Los Angeles, California.

Dr. J. W. Ekblad of Duluth spent the month of February at the home of his parents in Kansas.

Dr. M. B. Bonta, Rochester, recently returned from a three weeks' clinical trip to New York and Boston.

Dr. H. B. Grimes of Madelia was re-elected for his third successive term as mayor of Madelia at the 1924 election.

At a recent meeting of the Northwest Pediatric Society, Dr. H. G. Irvine, Minneapolis, gave a paper on "Infantile Eczema."

Dr. W. C. Portmann of Jackson, who is now on the Pacific coast, will return to his practice at Jackson about the middle of April.

Dr. E. J. Pengelly of the Cuyuna Range Hospital, Crosby, is now in Chicago, where he is doing postgraduate work in medicine and surgery.

Dr. W. J. McCarthy of Madelia resigned as president of the local school board at a recent meeting, following twenty years of service on the board.

Plans are being made for the construction of a twenty-five-bed hospital at Morris. The building will be of brick construction and will be fireproof throughout.

Dr. E. W. Fahey, Duluth, has been appointed to succeed the late Dr. E. W. Buckley of St. Paul as supreme physician for all lodges of the Knights of Columbus.

Dr. L. E. Claydon of Red Wing has returned from a two months' visit at his former home in England. While there he visited the principal clinics of England and Scotland.

The contract for the interior finishing of St. Luke's Hospital of Duluth was let March 21st. It is planned to have the building ready for occupancy by the first of next year.

Drs. G. A. Paulson, P. F. Eckman, and M. G. Gillespie, all of whom recently completed their internship at St.

Mary's Hospital of Duluth, have located in that city permanently.

Dr. H. G. Reineke of New Ulm is now located in Villard for the practice of his profession. Dr. Reineke was formerly associated with his father, Dr. George F. Reineke, at New Ulm.

Dr. William H. Barr of Wells has been appointed a member of the State Board of Medical Examiners to succeed Dr. A. F. Schmitt, formerly of Mankato, now of Minneapolis.

Dr. D. W. McDougald, who recently completed a course in postgraduate study in New York, is now located at 400 East Hennepin Ave., Minneapolis, for the practice of his specialty in eye, ear, nose and throat work.

Three new members have been added to the staff of Dr. C. T. Granger of Rochester: Dr. R. W. Allen, specialist in obstetrics; Dr. J. N. Guthrie, ear, nose and throat specialist, and Dr. Clara G. Cook, who is a specialist in the diseases of children.

The Goodhue County Medical Society has endorsed the work of the County Health Association and the Red Wing Visiting Nurses Association in establishing children's clinics. Dr. W. D. Beadie of Cannon Falls will be in charge and one or more local physicians will be associated with him in each city where the clinics are held. The first clinic was held at Red Wing on March 11th and was well attended.

Dr. J. W. Andrews of Mankato has returned from a trip to Florida, where he spent the winter months. Dr. Andrews has sold his interests in the Mankato Clinic, but will retain office room in the Clinic building, where he will be able to meet old friends and patients. Although retiring from active clinical work, Dr. Andrews will continue a private practice. He is numbered among the oldest active practicing physicians in Minnesota.

Dr. E. A. Meyerding resigned as director of hygiene in the St. Paul schools, March 17, to take up his new duties as executive secretary of the Minnesota Public Health Association and the management of the *Northwestern Health Journal*. Dr. Meyerding inaugurated health work in the St. Paul public schools in 1909 with a staff of two, himself and one nurse. The department now numbers eighty-five employees. Dr. Meyerding succeeds Dr. W. F. Wilde as executive secretary of the Minnesota Public Health Association, of which Dr. H. Longstreet Taylor, St. Paul, is president.

New Prague is to have a new Community Hospital through the generosity of Mr. and Mrs. W. L. Harvey, formerly residents of the town. Recently they presented the locality with their handsome residence for conversion into a hospital. The building was thoroughly inspected by a committee, assisted by Dr. L. B. Baldwin, superintendent of the University Hospital, and it was determined that with slight changes, the building will be suitable for hospital purposes. An association has been formed and a sufficient fund is being raised to start the project. The hospital will be run on a cost basis, and it is hoped will be in operation this spring.

Mr. and Mrs. C. E. Friedrich and Miss Helen Friedrich of Red Wing, Minn., have given \$35,000.00 to the Red Wing Hospital Association to be used for the erection of an addition to the Red Wing Hospital. Mr. and Mrs. Friedrich give \$20,000.00 as a memorial to their son, Edward H. Friedrich, and Miss Friedrich gives \$15,000.00 as a memorial to her mother and to her brother, John H. Friedrich. A large frame building, which was built by Gen. Jennison and later was the original hospital, will be removed to an adjoining lot and remodeled into a nurses' home. The sum necessary for this purpose, about \$5,000.00, will be raised by subscription.

OBITUARY

DR. THEODORE C. LUND

Following an illness of but a week's duration, Dr. Theodore C. Lund of Hutchinson died at his home, Monday, February 25, 1924. Death was due to pneumonia. Dr. Theodore Christian Lund, son of Rev. and Mrs. J. Th. Lund, was born in Minneapolis on December 6, 1891, being 33 years of age at his death. With his parents he lived for a time at Blair, Nebraska, and at Salt Lake City, where he first took up his medical studies. He was graduated from the University of Minnesota medical college in the year 1917. At the outbreak of war he was stationed at a hospital in New York City. He enlisted in the service and was placed on the medical reserve list, but was not called for active duty. He returned to Hutchinson in 1919 and since that time had practiced his chosen profession. In this short time he built up an extensive practice and won a host of friends by his ever congenial and pleasant disposition.

On August 10, 1916, at Brush, Colo., Dr. Lund was united in marriage to Miss Christina Danielson of Brush. To this union were born two children, Jane, age 5, and Ruth, age 2, who together with their mother are left to mourn the loss of a kind husband and devoted father.

Dr. Lund also leaves to mourn his untimely death, his father and mother, Rev. and Mrs. J. Th. Lund, Minneapolis; three sisters, Mrs. Marcus Beck of Blair, Neb.; Mrs. Chris Betker of Hutchinson, and Miss Beulah, besides numerous relatives and friends.

DR. JACOB L. HOFFMAN

Dr. Jacob L. Hoffman, a practicing physician at Henning for the past twelve years, died in Minneapolis at the age of 59 years, February 6, 1924.

Dr. Hoffman was born in the province of Trondhjem, Norway, June 2, 1865. His father was a physician and he sent Jacob at an early age to the Christiania medical college. He graduated with high honors, there being but one other student in his class that ranked higher. Later he went to Berlin and studied for one year. He came to America about 25 years ago, first practicing his profession in Eau Claire, Wis. He went to Elbow Lake, where he practiced several years before coming to Henning 12 years ago. He is survived by a wife and three children; also by his father, mother, four sisters and two brothers, who reside in Norway.

DR. JOHN S. SEELEY

Dr. John S. Seeley, graduate of the University of Michigan, 1876, died March 2, at Faribault, at the age of 71. His first work in Minnesota was at Cordova, Le Sueur County. Since then, for 39 years, he practiced at Faribault.

DR. J. A. McAULIFFE

Dr. J. A. McAuliffe of Duluth died March 23, 1924, at St. Mary's Hospital, where he had been a patient since suffering a stroke of apoplexy nearly two years ago.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

ABBOTT LABORATORIES:

Butesin Picrate

Butesin Picrate Ointment

PARKE, DAVIS AND CO.

Dibromin

E. L. PATCH CO.:

Patch's Flavored Cod Liver Oil

VITALAIT LABORATORY OF CALIFORNIA:

Vitalait Culture Bacillus Acidophilus

WILSON LABORATORIES:

Epinephrin-Wilson

Epinephrin Powder-Wilson.

Epinephrin Solution, 1:1,000-Wilson

Corpus Luteum-Lederle.—The fresh substance from the corpora lutea of the hog or cow, dried and powdered. For a discussion of the actions and uses of ovary preparations, see New and Non-official Remedies, 1923, p. 210. Corpus luteum-Lederle is supplied in the form of 2-grain tablets only. Lederle Antitoxin Laboratories, New York.

Corpus Luteum Extract-Lederle.—A sterile solution of those constituents of the corpus luteum which are soluble in water containing sodium chloride 0.85 per cent, sodium citrate 1 per cent and chlorbutanol 0.5 per cent. Each c.c. contains 0.02 gm. of soluble matter in addition to sodium chloride, sodium citrate and chlorbutanol. For a discussion of the actions and uses of ovary preparations, see New and Non-official Remedies, 1923, p. 210. The preparation is marketed in 1 c.c. ampules and in 5 c.c. vials. Lederle Antitoxin Laboratories, New York.

Ovarian Residue-Lederle.—The residue from the fresh ovaries of the hog or cow after the ablation of the corpus luteum, dried and powdered. For a discussion of the actions and uses of ovary preparations, see New and Non-official Remedies, 1923, p. 210. Ovarian residue-Lederle is supplied in the form of 3-grain tablets only. Lederle Antitoxin Laboratories, New York.

Silver Nitrate Solution 1 Per Cent-Lederle.—An aqueous 1 per cent solution of silver nitrate contained in ampules composed of beeswax. The preparation is intended for the prophylaxis of ophthalmia neonatorum. For use, a pin hole is made in the ampule and, after suitable preliminary cleansing of the eye, two drops are placed in each eye of the newborn. Lederle Antitoxin Laboratories, New York.

Whole Ovary-Lederle.—Whole ovarian glands of the hog or cow, freed from extraneous matter and dried at or below 38 C. For a discussion of the actions and uses of ovary preparations, see New and Non-official Remedies, 1923, p. 210. Whole ovary-Lederle is supplied in the form of 5-grain tablets only. Lederle Antitoxin Laboratories, New York. (Jour. A. M. A., Feb. 2, 1924, p. 391.)

Flumerin-H. W. and D.—Disodium-2-hydroxymercurifluorescein. The disodium salt of 2-hydroxymercurifluorescein. Flumerin-H. W. and D., when injected intravenously, is tolerated by rabbits in doses containing from eight to twenty times the amount of mercury present in the therapeutic dose of other mercurial drugs commonly used. When injected into rabbits with syphilitic lesions, the drug brings about resolution of the lesions without apparent injury to the kidney. When injected intravenously into man in doses of 3 mg. per kg., flumerin has caused the disappearance of spirochetes from primary and secondary syphilitic lesions. Flumerin has brought about resolution of the lesions and in about one-half the cases changed a positive blood Wassermann reaction to negative. In tertiary syphilitic lesions resolution of the lesions with a disappearance of a positive Wassermann was brought about in a majority of cases treated. The dose of flumerin-H. W. and D. is from 0.002 to 0.005 gm. per kg. of body weight injected intravenously in 2 per cent aqueous solution. The drug is marketed in tubes containing respectively 0.15 gm., 0.20 gm., 0.25 gm. and 0.30 gm. Hynson, Westcott and Dunning, Baltimore. (Jour. A. M. A., Feb. 9, 1924, p. 469.)

Epinephrin-Wilson.—A brand of epinephrin-N. N. R. Made from the suprarenal gland. For a discussion of the actions, uses and dosage of epinephrin, see New and Non-official Remedies, 1923, p. 112. Epinephrin-Wilson is marketed in the form of epinephrin powder-Wilson (vials containing epinephrin-Wilson, 1 grain) and epinephrin solution, 1:1,000-Wilson (containing epinephrin sulphite equivalent to 1 part epinephrin-Wilson in 1,000 parts of physiological solution of sodium chloride). Wilson Laboratories, Chicago. (Jour. A. M. A., Feb. 23, 1924, p. 531.)

PROPAGANDA FOR REFORM

Immunization Against Typhoid.—Ordinarily typhoid vaccine is administered at intervals of seven days. It is said that if the interval is less than seven days, the immunity may be less than after longer intervals. It is asserted also that the maximum response follows when the intervals between the injections are lengthened to eighteen or twenty days. No definite statement can be made as to what the optimal intervals really are. Immunity after anti-typhoid inoculation is not absolute. Army medical officers express the opinion that immunity from inoculation begins to decline in from two to two and one-half years; but even after four and five years, the typhoid rate of inoculated troops has been estimated at about one-fourth that of uninoculated troops. (Jour. A. M. A., Feb. 2, 1924, p. 411.)

The Absorption of Epinephrin.—Although epinephrin is absorbed from the mucous membranes of the nose, throat, mouth, urethra, vagina and rectum, the effectiveness of such modes of introduction is too uncertain to make them popular. The drug is not absorbed from the gastrointestinal

canal to induce any appreciable effect. Intravenous administration must be used with extreme caution and the manifestations secured are likely to be rather evanescent. The response to intramuscular injection is considerable. There is a widespread belief that the subcutaneous administration of epinephrin causes little effect and that the action is decidedly uncertain. However, the relief which is secured from the hypodermic injection of epinephrin in asthmatic patients is evidence that absorption by this route is rapid and satisfactory. It probably proceeds by lymphatic rather than by blood vascular channels. (Jour. A. M. A., Feb. 9, 1924, p. 473.)

The Insulin Reserve.—It is highly probable, according to R. N. Wilder, that patients with the acute type of diabetes will in a few years lose all native tolerance for glucose, and become completely dependent on insulin. In such cases, 37 units (old standard) of insulin may be required, and in some cases as much as 56 units a day. A partially diabetic patient may suddenly be converted into a totally diabetic patient by infection and, therefore, a month's supply of insulin should be kept on hand. Reginald Fitz and William P. Murphy state that there are two classes of diabetic patients: those to whom insulin is a luxury and those to whom it is a necessity. They hold that the wise physician will conserve the use of insulin to the cases of such diabetic patients as can dispense with it or use only small amounts and will hold it in reserve as an indispensable product, for the patients who require large amounts in order to secure definite results. (Jour. A. M. A., Feb. 9, 1924, p. 473.)

Treatment of Pernicious Anemia.—Arsenic and blood transfusion are the two established forms of therapy in the treatment of pernicious anemia, though neither is curative. Arsphenamin in doses of 0.03 to 0.06 gm. intramuscularly at intervals of days or weeks has been found useful in some cases, though it has failed in others. (Jour. A. M. A., Feb. 9, 1924, p. 491.)

Ichthyol and Ichthalbin Omitted from N. N. R.—The Council on Pharmacy and Chemistry publishes a report announcing the omission of Ichthyol and Ichthalbin from New and Non-official Remedies and a report on the therapeutic value of Ichthyol on which the deletion of Ichthyol and Ichthalbin is based. Ichthyol was introduced into dermatology about forty years ago, and it came into wide use during its skillful exploitation. It has been difficult to obtain acceptable evidence concerning the therapeutic value of Ichthyol. The opinion in regard to its value has been divided, with good observers on both sides of the question. After some years of consideration and doubt, the Council has come reluctantly but decisively to the conclusion that there is no satisfactory evidence that Ichthyol has any therapeutic value other than that of a mild antiseptic and that of being soothing to inflamed mucous membranes. Merck and Co., who market the product in the United States, declined to limit their claims so as to harmonize them with the views of the Council, and, therefore, the Council has omitted Ichthyol from New and Non-official Remedies. The Council also omitted Ichthalbin, marketed by E. Bilhuber, Inc., New York. Ichthalbin is described as a compound of ichthyolsulphonic acid and albumin. Its actions are stated to be essentially the same as those of Ichthyol. Therefore, E. Bilhuber, Inc., was informed that,

unless the therapeutic claims made for Ichthalbin conformed to the claims permissible for Ichthyol, Ichthalbin would be omitted from New and Non-official Remedies. Circulars in use during 1922 contained recommendations for the internal use as an intestinal antiseptic and in skin diseases. Since these claims were incompatible with the evidence obtained by the Council, Ichthalbin was omitted. (Jour. A. M. A., Feb. 16, 1924, p. 565.)

Carbon Tetrachlorid for Hookworm.—Carbon tetrachlorid is at present obtaining such an amount of favorable notice that, unless subsequent experience demonstrates as yet unknown dangers, it may be considered a suitable method for the treatment for hookworm. The drug is palatable, requires no preparation of the patient and is relatively non-toxic. The only fatal results so far recorded were associated with the use of an impure product. The commercial product is unfit for use. Hence, the New and Non-official Remedies quality should be insisted on by prescribing carbon tetrachloride Medicinal-N. N. R. The dosage generally recommended is 0.2 c.c. (3 minims) for each year of life; with an adult, a dose not exceeding 3 c.c. In prescribing, one may order twice the amount indicated for a single dose, and the patient may be instructed to repeat the dose at an interval of fourteen days. It is simply administered from a tablespoon which has been half filled with sweetened water. It is usually best to administer magnesium sulphate two hours after the drug is given. (Jour. A. M. A., Feb. 16, 1924, p. 569.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

MEETING OF FEBRUARY 13, 1924

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, February 13, 1924, at 8 o'clock. The meeting was called to order by the President, Dr. Hamilton. There were thirty-eight members and five visitors present.

The minutes of the January meeting were read and approved.

The following members reported cases:

1. DR. E. L. TUOHY (Duluth) gave a résumé of cases and records, and a method of showing typewritten data on lantern slides.

Lantern slides were shown with very abbreviated summary of case records. This typed material was fastened to the ordinary lantern slide, according to a method which makes unnecessary any photography whatever. Lantern slides can be made in a matter of a very few minutes by typing directly upon what is known as "Radio-Mat" slides.*

A case was shown with lantern slide of the roentgen picture of the lungs, which prior to autopsy was taken to be miliary tuberculosis. This diagnosis was substantiated by the gross examination of the lungs themselves. However,

the microscopic examination of the tissues revealed miliary carcinomatous metastases, and the original source was found to be annular scirrhous carcinoma near the pylorus.

A record was shown of a forty-five-year-old woman, with moderately advanced pulmonary tuberculosis. Her gastrointestinal symptoms were attributed to either the toxemia of the advancing tuberculosis, or late invasion of the gastrointestinal tract, resultant from the terminal depression of her vitality and immunity. On autopsy a few small ulcers were found in the intestine, and a very few tubercles over the surface of the peritoneum. However, a definite large, non-tuberculous gastric ulcer was found. (Specimen was shown.)

The record of a man, aged 50, was shown, who had fully-proven chronic endocarditis with mitral stenosis and auricular fibrillation. A period of restored health was interrupted by much gastric irritability. It might have been assumed that this was entirely secondary either to digitalis medication or to the common visceral congestion incident to the heart state. On the contrary, careful roentgen investigation and analysis of his gastric distress and food relief, established with certainty the diagnosis of duodenal ulcer. The customary frequent feedings and alkalies have very promptly given him relief.

A case record was similarly shown of a man, aged 33, with an early history of throat infection, otitis media and running ears. Recently he developed dyspeptic signs, with characteristic food relief, two or three hour pain after eating, etc. This state of affairs yielded in a short time to a situation in which he did not have food relief nearly so constantly, and his distress followed soon after eating, with a burning sensation in the epigastrium communicated up into the chest. Careful roentgen studies showed up a definite defect in the duodenum but in addition also a penetrating ulcer in the lesser curvature. The latter was evidently of more recent origin, or at least activity, than the former. Realizing the great importance of focal infection and the situation obtaining with his running ears, this was the quandary: one of his ears is good; the other is bad from the standpoint of hearing; what advantage would there be by taking a chance of operating upon his bad ear, to limit focal infection, without attacking the other? Is it not better for him to take a chance even with his ulcer, an ordinary treatment, than to endanger the good hearing he has in one ear by radical operation?

Three cases were shown in brief in which at autopsy primary carcinomata of the bronchi were proven up. In all of these cases metastases had occurred to the spinal column (illustrating the accepted frequency of this type of bony invasion on the part of bronchial carcinoma).

One of these cases presented itself with an outspoken swelling over one parietal bone, strongly suggesting lues. A biopsy readily showed it to be a malignant metastasis.

In only one of these three cases was there particular cough or manifest chest symptoms. It can be said at least that without very careful and accurate post-mortems the origin of these malignancies would have been overlooked, and thereby the probable frequency of primary carcinoma of the bronchial tubes underestimated.

*These sheets can be secured from any of the dealers in moving picture equipment and materials.

One of these cases presented the curious picture of definite kidney tumor, which with easily recognizable metastases into the spine made the probable diagnosis of the fairly common condition of hypernephroma most likely. The autopsy in this case showed bilateral hydronephrosis incident to calculi, shadows of which did not appear in the original spine pictures taken with the intention, because of obvious spinal compression, to show vertebral column detail.

2. DR. A. E. BENJAMIN reported a case of obstructive jaundice.

Mrs. S., age 48, female, weight 210 pounds, farmer's wife.

Family History: Father died of tuberculosis. Mother 82, in poor health. Four brothers well, one died in infancy. Three sisters well, one died aged 42 of gall stones.

Personal History: Has had children's diseases. "Stomach trouble for years." Attacks of acute indigestion from special foods. Attacks would last twenty minutes. Would become distended with gas, and had vomiting spells. Considerable belching of gas. Bowels habitually constipated. Saline cathartics would relieve her of some of the stomach symptoms. Has always had kidney trouble.

Complaint: Taken ill about the middle of November. Very nervous. Pain in lower part of abdomen. No backache except low down, across the hips. No pain over gall bladder. Pain would extend to left, under ribs. Jaundice began about Thanksgiving time,* but not marked until about three weeks ago. Itching began at night when nervous. Would scratch and cause bleeding. Some subcutaneous hemorrhage about January 20th. Spots enlarged and spread. Few vomiting spells.

Chief Symptoms: Jaundice and hemorrhagic painful swelling, anorexia, delirium.

Examination: Skin markedly jaundiced. Heart, lungs, nose, throat, and pelvis negative. Subcutaneous hemorrhagic areas throughout skin, especially on abdomen and limbs. Considerable swelling of left leg, resembling thrombosis.

Laboratory report: Bleeding and clotting time—45 minutes. Hgb. 50% (Dare). Red cells 3,180,000.

Diagnosis: Pre- and post-operative, and pathological after autopsy—"obstructive jaundice."

Treatment: January 18th, 1924. Local anesthesia, vein at elbow exposed. Five c.c. 10 per cent sol. of calcium chloride injected slowly. January 19th, 1924. Local anesthesia, old incision at elbow opened. No vein available. Vein in foot was used. Five c.c. calcium chloride injected. January 19th, 1924. In evening, blood transfusion, given 500 c.c. Patient died late at night, January 19th, 1924.

Autopsy report (Dr. J. S. McCartney, Jr., pathologist): Autopsy limited to examination through abdominal incision.

The body is that of a very obese white woman, 167 cm. in length and weighing at least 210 lbs. Rigor mortis is present. There is hypostasis posteriorly; no edema or cyanosis. Scattered over the trunk and extremities are numerous small blood encrusted areas. These in the beginning are said to have been petechiæ but now are covered by crusts. Scattered over the surface of the body are nu-

merous bluish black irregular areas which are not due to hypostasis and clinically were large hemorrhages. The body shows marked jaundice (grade 3). The pupils are equal and regular.

Abdominal incision made. The subcutaneous fat over the abdomen is 5 cm. in thickness. In the fat in the incision an area of hemorrhage is found in the epigastric region. The peritoneal cavity contains no abnormal fluid. Scattered over the intestines are numerous subserosal hemorrhages, some of which reach 1 cm. in diameter; the majority are less than 5 mm. There is marked retroperitoneal hemorrhage, particularly posterior to the cecum and sigmoid. That about the cecum extends beneath the peritoneum onto the anterior abdominal wall. There are a few fibrous bands between the gallbladder and the duodenum.

The pleural cavities and lungs palpated through the diaphragm; no lesion made out. The heart on palpation is normal in size; it is not removed.

The spleen is about normal in size. It is flabby. External surface is slightly wrinkled. On section it is light red in color and the markings are rather indistinct.

The liver is of about normal size. The external surface is smooth. On section the organ is markedly bile stained, the centers of the lobules being prominent. The gallbladder contains several dozen faceted calculi, yellowish white in color and averaging about 6 mm. in diameter. The cystic duct is very markedly dilated, measuring about 8 mm. in diameter. Calculi are found within the cystic duct. The common bile duct is a little larger than the cystic duct and in it calculi are also found; one about 3 mm. in diameter is found just inside the ampulla. The common hepatic duct is about the size of the dilated cystic duct. Calculi are also found within it and in the right and left hepatic ducts up into the substance of the liver. No calculi are found farther than a point 3 cm. above the beginning of the common hepatic duct. The opening through the ampulla is of about normal size.

The stomach contains some cloudy mucoid material. No gross lesions are found in the mucous membrane. The pancreas is about normal in size and shows some fat replacement of the parenchyma. On following out the pancreatic duct it is found to open into the intestine through the ampulla separate from the common bile duct.

The right kidney weighs 140 grams, the left 150 grams. The capsules strip readily, leaving smooth surfaces. On section the organs show marked bile staining and are slightly swollen and cloudy. A few petechiæ are found in the pelvis.

The uterus, tubes and ovaries are apparently normal. The abdominal aorta shows a slight senile change. No further examination of this body is made.

Diagnoses:

1. Calculus obstruction of the common bile duct.
2. Dilation of common, hepatic and cystic ducts.
3. Moderately distended gallbladder.
4. Calculi in gallbladder, cystic, common bile and hepatic ducts.
5. Nephrosis of jaundice.
6. Marked jaundice.
7. Cutaneous hemorrhage.
8. Retroperitoneal hemorrhage.

3. DR. J. F. HAMMOND reported the following case:

This case was admitted to the City Hospital on February 3, 1924. A girl, 17 years old, missed a period the first part of January and thought she was pregnant. She inserted a



catheter with a wire stylet. The following day she began to bleed and had a good deal of pain. Three days later the pain was more marked in the lower abdomen and a physician was called who took care of her from that time until she was admitted to the hospital on Feb. 3, 1924.

On admission it was difficult to get much history. Apparently she had had a stormy time. She did not give any history of chills but had a lot of pain and a good deal of bleeding. She was admitted to the hospital in the early morning of the 3rd. When I saw her on this date she was very much distended, the abdomen being quite prominent. Temperature 104. No pain or tenderness, but marked distention and very rigid. She had a cough; I examined the chest, and the signs were a little irregular. I thought I found some dullness in the back on the right side. The breath sounds were markedly diminished and I thought she probably had some fluid. The liver dullness was completely obliterated. I wanted to find out about the chest condition and thought the easiest way was to take a picture of it. (X-ray shown.) Both lungs were compressed to about the level of the third costal cartilage; the peritoneal cavity was distended with air. The patient seemed to be in extremis. Dr. Drake, Dr. Hall and Dr. Daugherty saw her with me. Nothing much could be made out in the

abdomen, but we felt we might drain her from below and improve her temporarily. We gave her a little ethylene and made a vaginal section. At least a gallon of pus and a large amount of air were evacuated. Cultures did not show that there was any bacillus aerogenes infection.

Although the abdominal distention went down considerably, four days later she was still having a good deal of labored breathing, the liver dullness was still obliterated, and I felt it might be well to drain from above. Under ethylene I made an opening just above the pubes. It was very interesting to see the way the intestines were walled off. Between the omentum and the abdominal wall there was a space one could insert the hand without obstruction from the pelvic cavity to the top of the liver. Care was taken not to open the omentum, thus exposing the lesser peritoneal cavity.

Following this opening the liver dullness returned, and the abdomen was quite flat. The patient's breathing was improved. The day after the vaginal section an enema which was given promptly returned through the vaginal drain indicating a perforation low down in the intestinal tract.

This patient is still having a very bad time; she is very septic, and pulse is weak. She is somewhat cyanosed at times. The outcome is very doubtful.

NOTE: Since reporting this case on February 13th, 1924, the patient died on February 15th. I did not see the autopsy as I was out of town. The report states there was an abscess with feces between the liver and the diaphragm, also about the spleen. The only perforation mentioned was in the cecum. This would not coincide with the fact that an enema given returned at once through the vaginal drain.

DISCUSSION

DR. A. SCHWYZER: I think this is a very unusual case. The picture shows the enormous upward bulging of the diaphragm. This reminds me of a case of splenic anemia where we removed the spleen after it had been reduced by radium, and when we looked up into that dome of the diaphragm it had receded in an extreme manner on the left side. Every heart-beat made a wave-like undulation on this paralyzed and highly receded diaphragm. X-ray showed that for about two weeks it worked very little. It might be that we had to figure with a paralysis from an over-distention of the diaphragm. The case of Dr. Hammond illustrates how valuable the omentum is. Here is shown one of the most important functions of the omentum.

DR. M. S. HENDERSON (Rochester) read his thesis, entitled "Osteochondromatosis of the Hip Joint." (See page 261.)

DISCUSSION

DR. GEIST: Dr. Henderson has presented a topic of real scarcity. I have not seen disease of this type in the hip joint. Jones' work, to which Dr. Henderson refers, was done in Rochester and is a model of modern clinical research. The first case of this kind I ever ran into was

about 12 years ago, and involved the ankle; all my other five or six cases have been in the elbows and knees. The ankle case was a heavy man, weighing over 300 pounds. He had symptoms rather similar to locking of the knee joint; he had the sensation of being thrown and consequent effusion. The x-ray showed three or four bodies in the joint. On opening the ankle the bodies were easily recognized. There were six or seven bodies entirely loose within the joint. In addition to this, there existed about fifteen or twenty small osteo-cartilaginous bodies which were still attached by means of pedicles to the synovial membrane. In fact, some of the pediculated bodies looked like enlargements of normal synovial villi. Some of the pedicles were fairly strong and others were so frail that they were about ready to give way.

All of my cases were in adults and it is very interesting to find Dr. Henderson's case existing in an adolescent. I think Dr. Henderson is to be thanked for presenting this very interesting topic. I should like to ask Dr. Henderson what method of approach he used in opening the hip joint.

DR. A. SCHWYZER: About a year ago I had a case which does, however, not quite belong to this group. Laying all the muscles back from the outer iliac fossa and thus freely exposing the hip joint, we could open it, dislocate the femur very well and see all the parts. At the lower border of the capsule near the acetabulum there were bodies, some of them attached only by a thread, some rather large and hard, and some of them boggy. I was quite impressed by the ease with which we could see all the parts of the joint after cutting the capsule wide open and dislocating the femur. There were no loose bodies, but they were attached by thin pedicles.

I think the case of Dr. Henderson is an unusually pretty one and the x-ray pictures are very fine.

DR. HENDERSON, in closing: The incision used was the Smith-Peterson incision, which in reality is a combination of the old Larghi incision and the ordinary straight incision. We stripped the muscles down freely from the iliac bone, thus coming down upon the top of the joint. We then made a straight incision through the capsule and proceeded to remove the loose bodies.

Dr. Schwyzer's point is well taken. It might have been better to have made the incision larger and thrown the head of the bone out just as we do in an arthroplasty. Our hindsight is usually better than our foresight, and this might have given a better approach to the posterior part of the capsule, but of this I am not exactly sure. We might have been able then to reach the bodies in the posterior part of the joint.

I might add that we have used the Smith-Peterson incision now for some time in un-united fractures of the hip where we do a bone pegging operation, and it gives better approach than any other incision.

DR. R. E. FARR gave a talk on "Some Simple But Useful Adjuncts in the Practice of Surgery." Numerous lantern slides were shown.

The meeting adjourned.

JOHN E. HYNES,
Secretary.

TRANSACTIONS OF THE MINNEAPOLIS SURGICAL SOCIETY

STATED MEETING HELD DECEMBER 6, 1923, AT THE UNIVERSITY HOSPITAL. THE PRESIDENT, J. M. HAYES,
IN THE CHAIR

DR. S. R. MAXEINER: Case report of gunshot wound in right arm.

I wish to report this case because I believe it is of unusual interest, not so much perhaps from a scientific point of view as from the fact that an extremely difficult accident case treated by me at the Minneapolis General Hospital, with only a fair result, has, through another accident, been converted into what must be considered a much improved end result.

Mr. John W., age 29, male, single. Occupation, police officer.

Family history negative. Personal history negative—no operations.

Present illness: On December 20, 1920, while on duty with a shotgun squad, patient was accidentally shot in the right arm with a charge of buckshot, the end of the gun being practically in contact with his arm. He presented a large wound on the outer side of the arm and an extensive compound fracture of the humerus. The bullets took an upward direction, several coming out through the shoulder. The wound was treated surgically and the arm put up in a Thomas splint, with the arm in extension because of the difficulty of obtaining traction with the arm flexed. Dakin irrigations were used but suppuration was intense and, twenty days later, the wound was more widely opened. The wound drained for five and a half months and the splint was required for four months. Inflammation produced so many adhesions in and about the elbow-joint that it remained extended and could not be flexed. One year later an attempt, under anesthesia, to flex the elbow failed.

On January 28, 1924, the patient sustained his second accident, when he slipped on the ice and fell on the stiff arm. He again reported to the Minneapolis General Hospital, where he was treated by Dr. Watson, resident surgeon, who put the arm up in acute flexion under general anesthesia without difficulty, the elbow-joint being perfectly free. X-ray examination showed only two small chips, fractures of the epicondyles. Since January 4, 1924, the patient has been under my care as a private case and has been receiving both active and passive motion and massage and now has a range of motion of more than 45 degrees, with the arm in a much improved position. I hope not only to keep what we have gained but, by continued physiotherapy, to improve his present condition.

In this case the second injury undoubtedly broke up adhesions which we could not do under anesthesia. The x-ray at present shows what appears to be a hypertrophic arthritis.

DR. STRACHAUER presented the following cases:

Case 1. *Partial Gastrectomy*.—Cancer of the stomach. Patient 65 years of age. Operation performed under perfect local anesthesia due to the extreme enfeeblement, emaciation and chronic bronchitis of the patient.

Case 2. *Resection of Gastric Ulcer and Posterior Gastroenterostomy*.—Patient 11 years of age. A pre-pyloric, chronic, calloused ulcer was resected and a posterior gastroenterostomy performed. The patient had a history of ulcer since the age of 8 years, consisting of periodicity pain, nausea and vomiting, food relief, alkali relief, vomiting relief.

Case 3. *Splenectomy*.—Case of Banti's disease in a woman aged 36, on whom splenectomy was performed. Her hemoglobin of 32 per cent was brought up to 40 per cent by several transfusions. Following splenectomy the blood had spontaneously come up to over 60 per cent.

DR. R. E. FARR presented a paper, "Local Anesthesia of the Abdominal Sympathetic System."

DISCUSSION

DR. A. C. STRACHAUER: First, I want to congratulate Dr. Farr on his thoroughly good paper and lantern illustrations. I think the moving pictures are particularly fine. I can fully endorse the stand he has taken tonight regarding local anesthesia, and am especially gratified to have him call attention to the fact that local anesthesia is real anesthesia. A partial obtunding of pain, as is so frequently obtained, is not anesthesia. The defining of the various forms and types of anesthesia is important. The starting of an operation by the injection of a local anesthesia solution and then having to switch on to either ether or gas and terming the anesthesia "local anesthesia" is incorrect; it should be termed a failure. Likewise, the practice of preceding the injection of local anesthesia solutions by injections of scopolamine, morphine and the like, should not be called local anesthesia, but narco-local anesthesia. I believe that Dr. Farr was an ardent advocate of narco-local anesthesia at one time.

I have no patience with the practice of so-called "local anesthesia" preceded by a "knockout" of some narcotic. I have seen, on a number of occasions, patients brought to the operating room so deeply under the influence of scopolamine and morphine that it was wholly unnecessary to use local anesthesia. They were unable to sit up unassisted and did not know where they were. One of the most distressing situations I know is that of an operation being forced through with the patient under only partial local anesthesia, the patient suffering pain and the operator denying that the patient is suffering. Local anesthesia is real anesthesia. With a properly performed technique, local anesthesia can be obtained in the majority of patients.

For a considerable period of my practice, particularly here in the University Hospital, I did something over 80 per cent of my work under local anesthesia, mostly of the blocking type, which I preferred to infiltration, including surgery of the brain, spinal cord, thorax, abdomen, and extremities. At present I prefer general anesthesia as a routine, employing local anesthesia only on special indication, as I feel that with the majority of patients it is better

for psychic reasons that they be not present at their own operations. The cancer of the stomach specimen which I showed this evening was removed under local anesthesia, due to the patient's enfeeblement, advanced age and chronic bronchitis. The choice of the anesthetic may be largely a matter of individuality, and I believe I am becoming more tolerant in this matter of individuality as affecting various surgical practices and procedures. My point is perhaps well illustrated by one of the Magnus Johnson stories. Magnus Johnson was recently consulted in Washington by an "agriculturalist" as to what he considered to be the best fertilizer. His answer was, "Vell, it is all a matter of taste." When visiting in Chicago last spring I found Bevan, Dean Lewis and other co-workers at the Presbyterian Hospital, extremely enthusiastic over ethylene. Dr. Crile and his associates in Cleveland were tremendously enthusiastic over nitrous-oxide analgesia in conjunction with novocain blocking of the field. Ether is the anesthetic of choice at the Mayo Clinic, in Rochester. It seems to me that it is in large degree a matter of taste, as the standard of surgery and the results are of the very highest order in all these centers.

There is no question at all, as I have proved by my work right in this hospital, but that the majority of surgical procedures can be carried out under perfect local anesthesia, but as to whether they should be performed under local anesthesia is another question. I don't want any one to tell me that I should be using local anesthesia to the exclusion of any other anesthetic.

I want to corroborate one more statement of Dr. Farr's and that is concerning the good work in local anesthesia by the younger men, including the internes and Fellows.

In the majority of instances the operator should perform his own local anesthesia. The assistant or interne is usually not familiar with the magnitude of the work to be undertaken and the field of injection is, therefore, frequently, inadequate. In addition to this, it is often necessary to enlarge the extent of the injection as the operation progresses.

As to the subject of splanchnic injection, there is no question as to the choice, the anterior being performed under direct vision and the posterior being a very blind and undependable procedure. In my personal experience it is the exception that the splanchnics require injection. I have performed a number of gastro-enterostomies and resections of the stomach without injection of the splanchnics.

Regarding the great variety of instruments which Dr. Farr has shown this evening, while they are extremely ingenious I know that it is unnecessary to have so much complicated equipment. Local anesthesia "tastes" good to him and all these accessories "taste" good to him, but it is not at all necessary to have so much machinery and paraphernalia.

DR. S. R. MAXEINER: I have always had a deep interest in local anesthesia, due to the fact that, ever since 1909, I have been pretty directly associated with Dr. Farr. In 1909 I was his interne at the General Hospital and in 1910 started with him, where I remained until I went into the Army, and what I have seen and learned of local an-

esthesia has been largely through the experience gained with him. As I traveled over the United States, through the East and elsewhere, I have seen many so-called cases of local anesthesia in which I would agree with Dr. Farr as to the nomenclature. I have also seen cases here in the hospitals where the interne would come to me and tell me that pneumonia followed certain cases of local anesthesia. When asked what the case was he would say, "gall-bladder." Then I would inquire as to whether gas had been used when they got down to the gall-bladder. "Yes." Well, that isn't local anesthesia. I do not say that pneumonia does not follow local anesthesia, but that, in my estimation and in our experience, these patients have had less severe attacks of pneumonia than they would have had following inhalation anesthesia. I recall an instance in one hospital where they had a much higher mortality rate from local anesthesia than from general anesthesia. When comparing their records case for case you would find that the statistics showed that practically all of their "locals" were cases in which general anesthesia was contraindicated. They were cases not suitable for any anesthesia. Dr. Strachauer mentioned the fact that the internes are doing work under local anesthesia. To be sure. During the last two years I have been doing part of the surgery, and during the last six months all of the surgery, at the Government Hospital and my internes have worked with me off and on for a year, assisting in the operating room continuously for six, eight and nine months at a time, without interruption, and I instructed them personally and have watched them develop. One of these boys, who had done probably sixty hernias and I should say forty or fifty appendices with me and under my supervision, now reports that he is out in the country and, without help, doing appendices under local anesthesia. Recently he did one on a kitchen table—an acute case—and had ideal anesthesia. The matter of technic I believe is extremely important in that the tissues cannot be mauled around as they can be under general anesthesia. This, probably, is one of the greatest advantages of local anesthesia. The patient will not have the gas pains, the distention, nausea, vomiting and shock which accompanies the rough handling of the tissues. I believe local anesthesia has taught me more respect for the tissues than any other thing, and the matter of handling the tissues is important. The lifting of the abdominal wall, packing away of the bowels, etc., is extremely important and vision is far more important here than the sense of touch. If, when the abdomen is opened, you have expulsive force with protrusion and intra-abdominal pressure and you can't expose the pelvis, you might as well change to general anesthesia at once. This morning I did a case of double salpingitis in the subacute state, with both tubes and both ovaries plastered down in the pelvis, with 100 per cent anesthesia and perfect negative, intra-abdominal pressure, and when I closed the abdomen at the end of the operation I could overlap the abdominal wall fully one inch because there was absolutely no expulsive pressure. I could not have done this five years ago, because I had not had the amount of experience. It is only when you do a large percentage of your cases under local anesthesia that it is possible to do the difficult ones under local, and negative pressure is

extremely important. It is the indicator of whether you have anesthesia or not.

DR. BRONCHOW (speaking by invitation): I would like to stress one thing Dr. Farr has brought out in his paper, namely, that *prolonged* special training is not required for surgery under local anesthesia. He has a stunt of calling upon his assistant, after being with him for a short time, to make the injection and carry through some abdominal operation with his help. Before coming in to his service as an assistant I had had no special surgical training, as you know. However, I recall one instance shortly after starting with him when he asked me to inject for and remove a subacutely inflamed appendix. The patient was a partially deaf Polish woman, which somewhat handicapped the psycho-anesthetist. However, the procedure was carried out satisfactorily and the anesthesia reported as ideal.

I admit, of course, that I had a good assistant, but most of the assistants here would agree that our chiefs as assistants are better surgeons. Similar experiences could be cited by any of his previous assistants and I am sure that one is not justified in thinking that prolonged special training is necessary provided the fundamentals of local anesthesia as outlined by Dr. Farr this evening are followed. The intra-peritoneal anesthesia, as described, because of its simplicity and practicability will undoubtedly be more widely used and is destined to become the method of choice.

DR. R. C. WEBB: The remarks which have been made concerning the conscious patient during an operation remind me of a recent experience with local anesthesia. A locomotive going at a high rate of speed left the rails and just before it tipped over the engineer went out the window. He received numerous injuries, among which was an inguinal hernia, as a result of the accident. When he had recovered sufficiently from his other injuries I repaired his hernia, using local anesthesia. He appeared to be well satisfied with the anesthesia and stated that I did not hurt him. He stated that the operation was painless, when interviewed a day or so later by a claim agent. When he had recovered and was settling with the claim department for the time lost and for the suffering which he had undergone everything was agreed upon except the hernia. He mentioned the hernia and the operation which he had to undergo and was reminded of his remarks concerning the lack of pain. He said, "Yes, but I think I ought to have something for the strain and agony of lying there on the table during that operation and expecting that he would hurt me."

DR. H. B. SWEETSER: Although I have used local anesthesia in a fair number of cases, I do not think I know enough about it, either to condemn it as many do, or to advocate it so absolutely for all operations as does Dr. Farr. Under certain circumstances and for certain operations I think it ideal, but, as Dr. Strachauer has said, "It is likely to be a matter of taste." In discussing the question of anesthesia, we must take into consideration, first the anesthetic, then the patient and lastly the operator.

If it were a question between a general anesthetic as dangerous as chloroform, for instance, and a local anes-

thetic as innocent as novocain, there could be no discussion as to method. If surgeons were limited to such a choice, then we would all be morally bound, in the best interests of our patients, not only to perfect ourselves in methods of local anesthesia, but to apply them in all cases where possible. But we are *not* so restricted; we *do* have general anesthetics which statistics show are fairly safe if expertly given. It is plainly evident, however, that surgeons are not satisfied with present methods or anesthetics, for constant effort is being made to devise better methods and discover safer anesthetics. This morning I had the pleasure of witnessing for the first time the giving of our latest anesthetic ethylene, here in the University hospital; and many times I have watched Dr. Farr do major operations very ideally with his local methods. At present it may be said that the great majority of surgeons have not concluded that it is necessary to abandon general anesthesia in the interests of their patients.

From the standpoint of the patient it is not all a question of abolition of pain. Many object to being conscious of the operation. But a graver question has to do with the nerve strain endured during a prolonged major operation. I have had patients ask if I were about through even before we had finished the aseptic preparation. If I am able to get perfect local anesthesia, I am willing to go as far as the patient, but if my patient wishes me to shift, I am never so wedded to the idea of success as not to be willing to shift, and I do not feel that I have failed. During thyroidectomy, if the patient gets nervous and asks if we soon will be through, I do not think it fair to keep repeating, "We will be finished in a few minutes," when we know we are not truthful; when this occurs I am glad to pocket my pride and switch to gas-oxygen. In the abdomen, without the expertness of Dr. Farr, I know we can get the much-sought-for negative pressure by blocking and opening the abdominal cavity under novocain, and then continuing with nitrous oxide gas, and no ether. This I think of especial advantage in cases where we are not certain as to what we will find and what we expect to do; it allows us to make a freer and wider investigation and possibly a more complete operation. We have used this combined method for a long time in many cases and have observed the results, and I am sure our mortality rate justifies its continuance. This does not mean that I never complete an abdominal operation under local anesthesia; I do; but that I am not willing to put too great a stress on the patient, as I think, unnecessarily. I was very glad to hear Dr. Farr and Dr. Maxeiner say that when you get expulsive efforts, you might as well quit, and I was very much interested to have them explain why they were so careful in handling retractors because any abnormal pulling or irregular traction might defeat the whole endeavor and compel them to change to general anesthesia. This explains some of my failures, and I intend to reform. Caudal anesthesia we have found very valuable and use it almost exclusively in operations on the perineum and bladder. Some patients are so phlegmatic in temperament that success with local anesthesia is assured, but many are so excitable that most surgeons, except enthusiasts, are not willing to make the trial. Of course, the nervous sys-

tem may be quieted by hypodermic medication, but this is no longer pure local anesthesia, but approaches general anesthesia.

As regards the operator, certain qualifications are essential. First, he must, by study and practice, perfect himself in the best methods. Necessarily, he must learn to handle the tissues with the utmost gentleness. Then he must be honest with himself and not try to deceive himself into believing that he is using local anesthesia while all the time his patient is complaining of pain. In other words, he must be humane. Just a word about the men who say they use local anesthesia. I have been around too many clinics and have seen many operations under so-called local anesthesia, and have shuddered to think that I myself might some day occupy the place of some of these patients. It is really horrifying to watch a patient undergoing a major operation, facing the possibility of death, and suffering pain, and to hear the operator telling him "he is not hurting him," "he is a coward," "he is a baby," "shut up," "lie still, or I'll squirt you in the face," etc. It is not only immoral, it is unchristian and inhuman.

DR. FARR'S closing remarks: I am very much pleased with the discussion and especially that of Dr. Strachauer. It makes me feel that his attitude towards local anesthesia is undergoing considerable change.

This paper was presented with the idea of calling to your attention the facility with which local anesthesia may be used in abdominal surgery as well as to show that there is a widespread belief that its application here is limited. I do not feel that it is necessary to have as elaborate an outfit as I possess for this work. However, equipment and surgical technic are especially important. Neither do I suggest that everyone else should use local anesthesia. I am simply trying to show what *can* be done. I also feel that acquiring the knowledge of how to use local anesthesia is not especially difficult at this time. In the earlier years it was difficult but at present we have an opportunity to see those who are well versed in the application and we may practice the art without harming our patients.

Beginners should not feel that it is a disgrace to be compelled to go to general anesthesia. An operation may be started under local and general may be added at any time that it becomes necessary.

Dr. Sweetser has asked regarding mortality. The question can only be answered provided groups of cases operated upon are alike. Two years after I began doing surgery I did 199 major operations without a death. At the present time I cannot duplicate this performance—I have a wider reputation and the cases coming to me are much more serious. For instance, if 50 per cent of one's operations are for laceration of the perineum his mortality is apt to be low. Someone has said that statistics may be used to prove anything, even the truth. My suggestion is that the method is the most benign yet developed and that it should be simplified as much as possible and that experience with the simpler cases will perfect a surgeon's technic so that he may be able to offer to those who should have local anesthesia its beneficent influence.

PROGRESS

Abstracts to be submitted to Section Supervisors.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
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ARTIFICIAL PNEUMOTHORAX IN PULMONARY TUBERCULOSIS, A STUDY OF 109 CASES—John T. Farrell, Jr., and Roland F. Fleck (*Amer. Rev. of Tuberculosis*, January, 1924): The indications for pneumothorax given by these writers who summarize the use of the treatment at White Haven Sanatorium, White Haven, Pennsylvania, are as follows: "Hemorrhage or persistent oozing which could not be controlled by simpler methods, failure to respond to routine treatment, and sometimes the idea of the lessening of toxicity by lowering temperature, decreasing expectoration or relieving cough, and in certain earlier cases to test the value of a method which was receiving commendation from other clinicians. Recourse was had to the method only after the patient had been carefully studied by one of the visiting physicians in his private practice, or after residence in the sanatorium. The control of collapse was determined by repeated physical examinations, and later by the combined use of this method and the x-ray, the latter by both the fluoroscope and stereoscopic plates."

Of the 109 cases 45 were improved, 42 unimproved and 22 died in the sanatorium. The percentage of improvement increased with the age of the patient. Patients who had had the disease from one to two years showed less improvement than those who had a history of symptoms extending over less than one year or more than two. The less extensive the involvement the greater was the percentage of improvement. The presence of tubercle bacilli is not a contra-indication to the treatment. Patients improving under preliminary treatment gained the most from the use of pneumothorax. The longer the duration of the pneumothorax treatment, the higher was the percentage of improvement.

ARTHUR T. LAIRD.

THE QUESTION OF THE MOST RELIABLE AUSCULTATORY SIGNS IN THE DIAGNOSIS OF PULMONARY TUBERCULOSIS—Fred H. Heise (*Amer. Rev. of Tuberculosis*, Nov., 1923): Heise examined a group of 1,000 cases. He classified them as follows:

Group	Physical Findings	No. of Cases	Parenchymatous X-ray Changes Per cent	Tubercle bacilli in Sputum Per cent	Clinically Tuberculous Per cent
1.	Broncho-vesicular breathing	248	40	18	59
2.	No abnormal sounds	45	51	22	60
3.	Breathing distant or exaggerated	13	31	..	67
4.	Indefinite râles . . .	36	53	19	72
5.	No râles, upper third of chest . . .	93	67	43	78
6.	Fine râles, upper third of chest . . .	140	78	45	82
7.	Moderately coarse râles, upper third of chest	425	98	47	99

In Dr. Heise's experience râles are the only auscultatory physical signs of any importance in the diagnosis of pulmonary tuberculosis unless breath sound changes are so marked as to approach the bronchial type. A negative physical examination by no means rules out clinical tuberculosis. The presence of broncho-vesicular breathing alone is not a particularly valuable sign of clinical tuberculosis.

ARTHUR T. LAIRD.

TECHNIQUE OF CHEST ROENTGENOGRAPHY—L. T. Black (*Amer. Rev. of Tuberculosis*, December, 1923): The author has endeavored to discuss the impracticability of Bray's technique. Bray's technique is, in brief, taking a posterior-anterior plate with standard and uniform methods, once during suspended costal inspiration, and immediately thereafter, during suspended diaphragmatic inspiration. Posterior exposures were preferred to the usual anterior (face to the plate) exposure, because on abdominal breathing the thorax does not remain in contact with the film owing to the protrusion of the abdomen, thus causing a technical difference which might prove confusing in diagnosis. Certain changes in the densities seen in x-ray plate were attributed to height and depth of the inspiration employed by the patient preparatory to the x-ray exposure. Comparisons were made in the height of the suspended costal inspiration with the height of the diaphragmatic inspiration. On costal inspiration expansion of the lung was manifested by an increase in the circumference of the chest, while on diaphragmatic inspiration, the chest remains immobile, and expansion is effected solely by the descent of the diaphragm. The direction in which the lung expands effects its shape. It is relatively short and thick on costal inspiration but long and narrow on diaphragmatic inspiration. Inasmuch as the hila move in unison with diaphragm, the hilar shadows may be two interspaces lower in diaphragmatic than in costal inspiration; and there may be distinctly appreciable changes in outline density. Annular shadows may be present in one and absent in the other. In certain instances, shadows termed as "hard" and regarded by some observers as denoting fibrosis and inactivity may be converted into shadows which are "soft" and commonly interpreted as evidence of an active lesion.

In a comparative study of roentgenographs, taking the posterior-anterior position during suspended diaphragmatic inspiration and suspended costal inspiration on 25 patients with pulmonary tuberculosis, there were found two cases of far advanced pulmonary tuberculosis in which the roentgenographs taken during suspended diaphragmatic inspiration revealed changes of a definite nature which were not revealed in the roentgenographs taken during suspended costal inspiration, thus corroborating Bray's observations. In a series of 11 cases, roentgenographs in the posterior-anterior position and anterior-posterior position during suspended diaphragmatic and suspended costal inspiration, there was found only one case in which the findings differed during suspended costal inspiration and diaphragmatic inspiration.

In spite of these findings and as a result of a general survey of the situation, considering the diagnosis of these differences and the economic side of the question, it can hardly be recommended that for general diagnostic purposes in pulmonary tuberculosis more than one type of position and inspiration be used. However, the matter of choice for general use rests entirely with the individual case.

J. R. FUCHLOW.

SOME RESULTS OF ARTIFICIAL PNEUMOTHORAX TREATMENT—William H. Morriss (Amer. Rev. of Tuberculosis, January, 1924): Since the opening of Gaylord Farm Sanatorium, Wallingford, Conn., 2,900 patients have been under treatment; 75 cases or 2.6 per cent have received artificial pneumothorax, a very conservative selection, as according to the author 5 per cent has come to be generally accepted as the usual proportion of cases found suitable for such treatment.

Morriss gives indications for pneumothorax treatment as follows:

1. Moderately advanced patients, whose lesion is either entirely confined to one lung, or in whom the lesion of the contra-lateral lung is apparently inactive and does not extend over more area than that portion of the lung above the second chondro-sternal articulation. This group is almost always given a trial on the usual regimen of rest treatment and only on failure to make a decided improvement is pneumothorax instituted. We include also in this group certain minimal cases, who after a fair trial on the rest regimen fail to rid themselves of signs of activity and whose x-ray picture shows a spreading lesion.

2. Moderately advanced or far advanced patients with chronic type of lesion usually associated with cavity formation. Here treatment may be undertaken on the more active lung even in the face of considerable trouble in the other side, in the hope of ameliorating symptoms and getting the patient up and around.

3. Severe or repeated hemoptysis, without a very marked lesion on the other side, provided that the side from which the hemoptysis is occurring can be definitely determined.

4. Very acute unilateral lesion, where x-ray shows a dense mottling confined to one lung. Our feeling here is that collapse should be induced without delay.

The later cases have uniformly been studied with the aid of x-rays.

The selective collapse described by Barlow, that is the tendency of small amounts of gas introduced into the pleural cavity to localize over the portion of the lung showing the greatest evidence of tuberculous activity, was found in 18 out of 38 cases of partial pneumothorax.

The results in the later cases treated were better than in the earlier series.

The late results of the second series (25 cases) show 52 per cent still under treatment, all improved. Of the others, 24 per cent have improved and eight per cent (2) have secured an arrest of the disease. Fourteen per cent only of all the cases in which a pneumothorax was established were treated more than a year.

ARTHUR T. LAIRD.

INTRAPERITONEAL OXYGEN INFLATIONS IN THE TREATMENT OF ASCITIC TUBERCULOUS PERITONITIS—Walter L. Mattick (Amer. Rev. of Tuberculosis, January, 1924). Pneumoperitoneum in the Treatment of Tuberculous Peritonitis—Oscar Monroe Gilbert (Amer. Rev. of Tuberculosis, January, 1924): Oxygen inflation of the peritoneal cavity was first used for diagnosis in 1902 by Kelling. In 1913 Godwin, after four years' experience with oxygen inflations following celiotomy in tuberculous (ascitic) peritonitis, noted the non-recurrence of the condition in patients so treated and was astounded that such a promising procedure was not more generally used. In 1913 Bainbridge described two methods of using oxygen after celiotomy and recommended its use for the following purposes: (1) to lessen shock, (2) to overcome negative pressure on certain types of tuberculous peritonitis, and (3) for effect on pus-producing bacteria and their toxins.

Stewart and Stein gave great impetus to pneumoperitoneum as an aid to x-ray diagnosis in 1919, and it was during the course of their work that Stein noticed the favorable results in cases of tuberculous peritonitis with ascites.

Mattick and Gilbert report three cases in which this method of treatment was used with apparent advantage to the patient, Mattick using oxygen and Gilbert filtered atmospheric air.

Mattick's technique was as follows:

"Operation: On October 27, 1922, under aseptic precautions, according to the above described technique, the patient's abdomen was pierced by the trocar and cannula about 1.5 inches to the left and below the umbilicus. Approximately 40 to 50 c.c. of clear amber fluid was withdrawn. After several attempts to remove more fluid, no more would drain out and oxygen was injected through the same cannula until the patient complained of discomfort from gas distention and liver dullness was obliterated. X-ray pictures were taken within one hour after inflation in both prone and lateral positions."

Gilbert introduced the sterile filtered air by means of a pneumothorax apparatus. All patients had some temporary discomfort.

ARTHUR T. LAIRD.

SURGERY

SUPERVISORS:

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PAPILLARY TUMORS OF THE RENAL PELVIS—

Albert J. Scholl (Surg., Gyn. and Ob., February, 1924): The majority of tumors of the renal pelvis are of papillary origin. In the early stages they are small, often multiple, flat or thickly pedunculated and confined to the renal pelvis. They grow rapidly and invade the whole kidney pelvis after distending it by masses of the growths. The ureter and bladder often become secondarily involved with transplants.

Hematuria is the most common symptom of this condition. The hemorrhage is usually profuse and may be continuous or intermittent. In differential diagnosis essential hematuria is usually characterized by a long continued mild hematuria with rarely any passage of clots. In cystoscopy a unilateral hematuria is demonstrated and if bladder metastases are present, papillary bladder tumors are seen.

Pyelography often makes the diagnosis certain by the distortion and filling defects. Pain of an aching character may be present over the kidney area and sometimes colicky pains may be present caused by the passage of blood clots. The prognosis is bad. Few remain well and free of metastases.

The treatment consists of nephrectomy with ureterectomy and constant checking up on transplants in the bladder with the cystoscope. If the tumors are too large to fulgurate resection is resorted to.

Eight cases with histories and plates are reported by the author, with the results to date.

W. P. HERBST.

A FUNDAMENTAL FACTOR IN THE RECURRENCE OF INGUINAL HERNIA—M. G. Seelig and K. S. Chouke

(Arch. Surg., November, 1923): Seelig and Chouke list as the essentials to a perfect cure, high sac ligation, restoration of the abdominal wall and primary wound healing. The first and last factor they dismiss with a word and go on to describe experiments designed to throw light on the possibility of complete and permanent restoration of the defective abdominal wall. This is usually attempted by suturing the internal-oblique and transversalis muscles and their conjoined tendon to the inguinal ligament of Poupart. The authors doubt if this procedure really accomplishes the intended purpose. Studies of fascia-muscle healing were carried out on dogs. A reduplicated edge of fascia lata was in each case sutured to the underlying muscles so that there was no tension on the suture line and that any separation could not be due to traction. Fifty experiments were carried out. In every instance where untraumatized muscle and fascia had been sutured together,

on healing the fascia was widely separated from the muscle to which it had previously been sutured. In every instance in which the muscle was traumatized by the excision of a wedge so that the fascia could be sutured in the raw trough, there was an attempt at direct union between fascia and muscle. This union was complete in only one instance. The authors conclude that attempted suture of muscle to fascia is inadequate and that to obtain good results one of the methods of uniting the fascia of the external oblique or the transversalis fascia to Poupart's ligament must be employed. The methods are those of Andrews, Pitzman, Harrison or Slattery.

DONALD K. BACON.

ACTINOMYCOSIS OF THE HEAD AND NECK. A REPORT OF 107 CASES: Gordon B. New and Fred Figi. (Surg., Gyn. and Ob., Nov., 1923.) Actinomycosis of the head and neck is probably the most commonly overlooked pathological condition occurring in this region. The infection is more common in males than in females, and may appear at any age. Seventy per cent of the patients reported were between the ages of twenty-one and fifty years. The activity of the disease bears no relation to the age of the patient.

All authors agree that actinomycosis occurs most frequently in the cervicofacial region. The 107 cases reported comprise 68 plus per cent of all cases of actinomycosis in the Mayo Clinic. Six cases of actinomycosis of the tongue were seen in the last three years and only 35 cases were found reported in the literature up to 1922.

The method of infection is very uncertain and different views are held by different investigators. Some contend that the infection is conveyed by direct contagion from cattle; others say that it is introduced by foreign bodies containing the organism; and still others hold that it is transferred by direct contagion from one human being to another. The organism has been demonstrated in carious teeth and tonsillar crypts of people with no demonstrable actinomycosis.

In this series of cases, 80 questionnaires resulted in finding that 56 per cent of the patients had not been in contact with the disease in cattle, and 43 per cent had been more or less closely associated with the disease in animals previous to the onset of their symptoms. Other facts are of importance, such as the presence of dental caries, picking decayed teeth with straws, or chewing bits of straw or grass.

"The clinical history of patients with actinomycosis of the head and neck depends on the virulence of the infection and the amount of secondary infection." The most common symptoms are stiffness, pain, and swelling in the region involved. The picture most common is that of multiple small draining abscesses.

Diagnosis must be based on the microscopic demonstration of the actinomycosis. The clinical picture and the presence of sulphur bodies help. Sulphur bodies are found most frequently in freshly opened pockets. Often it takes several weeks or more of observation to demonstrate the actinomyces microscopically and in 8 cases in this series the condition was not demonstrated microscopically. Actinomycosis of the tongue may simulate cancer, and infected cyst, or chronic cellulitis. Periosteal sarcoma must be

thought of and a list of conditions to be differentiated is given. "A tumor or gland of the neck or head which is clinically malignant, but does not prove so microscopically, is usually actinomycotic and further study of the issue may demonstrate this."

Of 85 patients, 70 per cent were well in from less than one year up to five or more years; 8.2 per cent were dead, and 21 per cent were under treatment. Six patients had meningeal involvement at the time of examination. One died from cancer which developed on an actinomycotic scar.

The best treatment to employ is drainage of abscess pockets and daily packing with iodoform gauze, radium, and iodides up to 200 grs. three times a day. The results from this treatment are very satisfactory and no patients except those with very advanced conditions with masses in the supraclavicular region, have had any extension develop in the chest.

W. P. HERBST.

HEMORRHAGE IN THE GENITO-URINARY TRACT

—William E. Lower (Surg., Gyn. and Ob., March, 1924): Hematuria from the genito-urinary tract is rarely alarming on account of the hemorrhage per se. However, it is a very important diagnostic symptom and should always be thoroughly investigated before a diagnosis of essential hematuria is made. Hematuria may be due to any of the following conditions:

(A) Outside the urinary tract:

1. Pathological conditions outside the genito-urinary tract.
2. Ingestion of certain drugs.
3. Acute and chronic febrile diseases
4. Scurvy.
5. Purpura.
6. Leukemia.
7. Pernicious anemia.
8. Septic infarct.
9. Aneurysm.
10. Syphilis.
11. Parasitic diseases.

(B) Within the urinary tract:

1. Bladder tumors.
2. Calculi urinary tract.
3. Renal tuberculosis.
4. Essential hematuria.
5. Cystitis.
6. Hypertrophy of the prostate.
7. Trauma.
8. Calculi in the bladder with hypertrophy of the prostate.
9. Carcinoma of the prostate.
10. Diverticula.
11. Hydronephrosis.
12. Cystic kidney.
13. Ulcer of the bladder.
14. Congenital deformity of ureters and kidneys.
15. Foreign body in bladder.
16. Papilloma of the urethra.
17. Strictures.

Tumors, tuberculosis, and calculi are the most frequent causes of hematuria, although some consider nephritis as first in importance.

Blood appearing at the meatus indicates a lesion anterior to the sphincter muscle. Blood at the termination of micturition is suggestive of a lesion within the urinary bladder. Blood in the semen suggests a lesion in the seminal vesicles or prostate. Blood after a renal colic suggests a lesion above the bladder. The source of bleeding is best discovered during a hemorrhage.

The author has charted 2,922 urogenital disease cases in respect to hemorrhage and lesion and concludes by saying:

"The above considerations emphasize the points that hematuria from the urogenital tract may be a symptom of almost any pathological condition within that tract and that therefore the presence of blood in the urine must be considered as an imperative indication for the application of every diagnostic measure at our command to locate the primary source of bleeding, and that no case should be classified as one of essential hematuria until every diagnostic measure has been applied without avail."

W. P. HERBST.

LATE ULNAR NERVE PALSY—Edwin M. Miller (Surg., Gyn. and Ob., January, 1924): Late ulnar nerve paralysis is peculiar in that it appears many years after the fracture. In nearly all cases the fracture occurs in childhood and usually between the third and fifth year. The usual type of fracture is one in which the external condyle is completely separated. Occasionally the site of injury has been at the internal condyle or in the supra-condylar region. Lateral and forward dislocation of the broken capitulum takes place and owing to inaccurate reduction non-union results, with a development of a cubitus valgus. The nerve is displaced from its bed as the olecranon process impinges against the medial condyle. This results in stretching and trauma to the nerve upon flexion. The paralysis in forty per cent of the cases occurred between 20 and 30 years after the fracture. It may begin as early as 3 or as late as 40 years after the fracture.

The methods of treatment are:

1. Cuneiform osteotomy to correct the deformity of the humerus.
2. Liberation of the nerve from its bed.
3. Transplantation of nerve in a new groove made by removal of a wedge-shaped piece of bone and lined with an aponeurotic-fascial flap.

The last method is the most popular method of treating the palsy. Ten case-records are given with illustrations and roentgenograms. Illustrations of steps in the operation of transplantation of the nerve to the flexor side of the elbow are given. As a prophylaxis against the development of the cubitus valgus deformity and the resultant ulnar nerve palsy an open operation with accurate fixation of the external condyle is suggested in those cases in which the external condyle cannot be accurately reduced by manipulation.

W. P. HERBST.

GYNECOLOGY AND OBSTETRICS

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THE LIPOIDS OF MATERNAL AND FETAL BLOOD AT THE CONCLUSION OF LABOR—J. Morris Slemons and Henricus J. Stander (Johns Hopkins Hosp. Bul., January, 1923): This report is based upon work done to secure information regarding the activity of the placenta in the transmission of fats from the mother to the fetus. The author believes that the human placenta is impermeable to fats, as such. He refers to animal experiments of Ahfeldt which show that, after intensive feeding of fats, the fat-content of the maternal blood becomes ten times that of the fetal blood. Also the work of Gage and Gage, and of Mendel and Daniels, which indicate that the placenta is an effectual barrier to the passage of fat.

Their own work consisted of determinations of the fat-content of the maternal blood together with that of the fetal blood, taken at the time of birth. This shows a uniform finding of a higher percentage of fats and lipoids in the maternal blood. It was impossible to demonstrate any constant relationship between the fat content, and the character or duration of labor, the type of anesthesia, or other complicating factors. Their results show a complete independence of the two organisms as regards fat metabolism, and justifies the assumption that the fetal fat is synthesized from some material (probably glucose) which is freely supplied by the mother and which passes through the placenta.

As regards lecithin, the physiologic rôle of this substance is still unexplained. It possibly plays a part in the early stage of fat-metabolism. The author's studies indicate the same independence of the maternal and fetal circulations as regards lecithin content. The maternal lecithin increases towards the end of gestation, possibly as a preparation for lactation. The fetal blood plasma has a lower content, or about that of the normal adult.

The actual information concerning the significance of cholesterol is also meager. The cholesterol and lecithin seem to have certain antagonistic relationships, and are known to vary more or less simultaneously in amount. The increase of cholesterol may be part of a protective mechanism against an hyperlecithinemia. Although the concentration of cholesterol is never the same in the maternal and fetal bloods, the difference is neither constant nor characteristic. The authors have been unable to show any relationship between the cholesterol content and toxemia or eclampsia.

They conclude: 1. During the latter part of pregnancy, the fat, lecithin, and cholesterol content of the maternal blood increases, probably representing a preliminary step in the preparation for lactation. 2. The mother's blood contains much more of these substances than the

fetal blood does, and there seems to be a complete independence between the two organisms. 3. The placenta is impermeable to these substances. 4. Fetal fat then must be synthesized, probably from glucose, which is freely supplied by the mother in response to the demands of the fetus. 5. There is no characteristic change in the blood fat or blood lipoids accompanying the development of eclampsia or the allied toxemias.

ARCHIBALD L. McDONALD.

THE OCCIPUT POSTERIOR—P. T. Harper (Amer. Jour. Ob. & Gyn., Vol. 8, p. 53): The author presents this subject because he believes that no obstetric condition, which occurs as often, incurs more difficulties and responsibilities. It is pointed out that statistics based on examinations made at indifferent times during labor are valueless in determining the frequency with which the occiput, at the onset of labor, is directed posteriorly. The author insists that the primary position of the occiput is posterior in approximately 50 per cent of the cases. It is emphasized that the clinical course of labor can be correctly interpreted if certain fairly constant physical signs are remembered. The most striking physical characteristic of the child when the position is posterior is a varying degree of deflexion or bending backward of the presenting part, the mechanics of which is discussed in some detail. The result of auscultation and abdominal palpation are dependable as early physical signs: hearing the heart tones in one or the other flank, and palpating the small parts anteriorly. When the head has advanced to the middle of the pelvis in posterior positions, the cervix is further back and the anterior lower segment is more elongated than in anterior positions. The mechanics of anterior rotation of a posterior occiput are discussed, emphasizing the fact that the forces and conditions which interfere with anterior rotation are due to inertia of the uterine muscle, deflexion and to lack of tone of the pelvic floor.

Vaginal examination shows three points of clinical importance when the head is well down: first, presence of the caput forward of the occiput is evidence of deflexion characteristic of all posteriors and can be taken as a measure of it in the individual case; second, its location at one side or the other of the sagittal suture shows primary location of the occiput to have been toward the opposite side; third, thickness or depth of the caput can be accepted as positive proof of the amount of muscular efficiency actually expended in driving the presenting part downward.

Treatment is taken up minutely and the author's summary follows:

Until the shoulders have become engaged, treatment that displaces the child's body toward the front and holds it there favors assumption of an anterior position by the occiput, provided the presenting part is so located that the occiput can rotate. The latter may lie above or below but not in the inlet. After engagement of the shoulders, neither forward displacement of the body nor even manual rotation of the occiput gives hope of permanent assumption of an anterior position by the latter; for, when the rotating force is removed, the occiput reassumes its anatomical relation to the shoulders. When labor is obstructed at the inlet or in

the upper middle pelvis and the occiput is posterior, the conditions to be treated are those that have caused obstruction, such as retraction and pelvic deformity, and not posterior position of the occiput. In other words, there is no treatment for the occiput posterior as such when the labor is obstructed high up. When the presenting part rests in the low middle pelvis or at the pelvic outlet and when anterior rotation and subsequent advance do not occur, treatment depends upon analysis of cause or causes of delay, in the management of which the most important item is artificial aid in doing what nature is unable to do, in doing it in the way that most closely simulates nature, and in doing it before untoward results of delay demand it. The judicious use of forceps meets each of these requirements.

He concludes by recommending that the attitude toward occiput posterior should be one of active expectancy, that is, applying treatment which is indicated, but not meddling.

L. M. RANDALL.

THE PATHOLOGICAL ANATOMY OF THE CORPUS LUTEUM (ABSCISS, CYST, HEMATOMA, AND NEOPLASM)—Emil Novak and Richard W. TeLinde (Johns Hopkins Hosp. Bul., September, 1923): This report is based upon an examination of the pathological material in the gynecological clinic of the Johns Hopkins Hospital for the past few years. The authors suggest the following classification to cover the various changes which are to be observed in the corpus luteum:

I. The normal cycle: (a) Stage of proliferation. (b) Stage of vascularization. (c) Stage of maturity. (d) Stage of retrogression.

II. Physiological variations: (a) Cystic form. (b) Hemorrhagic form. (c) Corpus luteum of pregnancy (cystic and solid).

III. Pathological variations: (a) Corpus luteum abscess. (b) Corpus luteum cyst: (1) recent, (2) old. (c) Corpus luteum hematoma: (1) recent, (2) old. (d) Corpus albicans cyst. (e) Corpus albicans hematoma. (f) Combined types. (g) Corpus luteum neoplasm (luteoma).

IV. Allied conditions: Multiple "lutein" cysts of the ovary.

The normal cyclic changes in the corpus luteum are well described and illustrated and the significance of each is discussed, particularly the relationship of the vascular stage to hemorrhagic changes, and of the retrogression, to the corpus albicans.

Variations in the cyclical changes are not infrequent, and it is difficult to distinguish between those which may be considered as physiologic, and those which are definitely pathological. Some consider all cystic forms as abnormal but the authors class as pathological only those which are larger than the normal ovary. Lutein cells showing more or less evidence of degeneration are to be found conspicuously in the cyst walls. Hemorrhage into the corpus luteum during the vascular stage is common, and the distinction between physiologic and pathologic types is not clearly defined. The corpus luteum of pregnancy is larger than that of menstruation and is more likely to be cystic. The latter type is found more often in cases of ectopic gesta-

tion. Hemorrhage is not uncommon in the corpus luteum of pregnancy, and there is a more complex organization of the fibrous structure.

Pathological variations: Abscesses have been frequently described. They are more likely to develop in the cystic or hemorrhagic forms, and are often associated with inflammatory pelvic lesions. The wall of the abscess shows the typical yellow color with inflammatory infiltration. They divide the corpus luteum cysts into the recent and old, which represent different stages of the same process. They consider as pathological those which exceed 2 c.m. in diameter. They are likely to be associated with abnormalities of pregnancy, pelvic inflammatory disease, or fibroids. There was little or no associated menstrual disturbance. The question of Corpus Luteum Persistens is discussed at some length, particularly in regard to its effect upon menstruation, and sterility. They believe that many of the reported cases are actually due to an unrecognized pregnancy, as may be proven by microscopic study of the endometrium.

The hematomas are relatively common, but there is no absolute distinction between the abnormal and normal types, except size. Most of their cases were associated with pelvic inflammatory disease which must be considered as a causal factor. They are classed as recent or old, depending upon the structure of the wall. As regards the neoplasm, the authors make no very definite statements. The article gives a comprehensive review of this subject and is worthy the careful study of all who are interested in the pathology of the corpus luteum.

ARCHIBALD L. McDONALD.

PEDIATRICS

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A STUDY OF THREE HUNDRED CASES OF PERTUSSIS IN A HOSPITAL—Charles Herman and Thomas Bell (Arch. of Ped.): 1. Females are more frequently affected with pertussis than males.

2. Eighty per cent of all cases of pertussis occur in children under 5 years of age.

3. The largest number of cases of pertussis occur during the summer months, at a time when the other communicable diseases are at their lowest point.

4. Every spasmodic cough is not whooping-cough. There are cases of pseudo-pertussis. The term pertussis should be restricted to an acute infectious and communicable disease, caused by the Bordet-Gengou bacillus.

5. The Bordet-Gengou bacillus is regularly present in the catarrhal stage of the disease.

6. Pertussis is most communicable in the catarrhal stage, when its true nature is not recognized. It is usually not communicable after the fourth week.

8. The respiratory complications are by far the most important. They are present in 58 per cent of the series. Fourteen per cent had a complicating bronchopneumonia.

9. The earliest and most characteristic change in those patients who have bronchopneumonia is the presence of localized fine resonant râles at the base or at the angle of the scapula, especially on the left side.

10. The susceptibility and unfavorable course of pneumonia in infants is probably due to immunologic, not to anatomic peculiarities.

11. There is no conclusive evidence that pertussis is an important factor in the causation of pulmonary tuberculosis. A positive Pirquet reaction does not become negative in the course of pertussis.

12. The principal aids in the early diagnosis of pertussis are the presence of a relative and absolute lymphocytosis in the blood; the presence of the Bordet bacillus in the sputum; and a positive complement fixation test. The cutaneous tests have not proved of any value.

13. The prognosis in pertussis depends on the age of the child, and on the presence or absence of pulmonary complications.

23. In the control of the spasmodic cough, antipyrin fortified by bromides has given the best results. We have not obtained favorable effects from injections of ether, or from vaccination.

24. Pertussis vaccine has a specific effect in about one-fourth of the cases. In those which fail to respond to treatment, the vaccine may be given too late or they may not be due to the Bordet bacillus.

R. N. ANDREWS.

PRELIMINARY REPORT ON THE TREATMENT OF PERTUSSIS BY THE X-RAY—Henry I. Bowditch and Ralph D. Leonard (Boston Med. & Surg. Jour., March 8, 1923): Twenty-six cases of active pertussis received X-ray treatment. The patients were from three months to forty years of age and were ill from one to ten weeks. Each patient received three or four x-ray treatments, at intervals of two to three days; the dosage was regulated according to the age of the patient, and the total amount of the X-ray given any one patient was well under an erythema dose. About ten per cent were prompt cures, spasms and cough disappearing entirely after two or three treatments; in a period of six days seventy per cent showed a very definite improvement, the number of paroxysms being much diminished to one or two a day, during a period of seven to ten days.

Ten to fifteen per cent showed no apparent benefit. The treatment at present is wholly empirical but the authors believe it may prove to be of more value than any other form of treatment.

THOS. MEYERS.

USE OF X-RAY IN TREATMENT OF PERTUSSIS—H. I. Bowditch (Boston Med. and Surg. Jour., Sept. 6, 1923): Three hundred and fifty cases were treated with the x-ray, the first three exposures at two-day intervals; if more were needed, they were given at intervals of a week, following the first three. Exposures were made alternately on the anterior and posterior aspects of the chest,

with clothes on, with the tube 26 inches away. Filter A was used, with 12 to 16 milliamperes from three to four minutes. Shorter treatments were given for children under eight months.

The results in the majority of cases were: eight hours after exposure the cough became softer and less frequent, vomiting and convulsions stopped, and the children slept. Sixteen hours later the cough became more characteristic, but vomiting and convulsions did not reappear. Subsequent treatment had similar effect.

One or two months after treatment the mothers reported 75 to 100 per cent improvement. Some found no relief; there was no absolute cure.

The treatment should be used in conjunction with vaccine.
THOMAS MEYERS.

THE TREATMENT OF WHOOPING COUGH IN PRIVATE PRACTICE—Wm. C. McKibben (Boston Med. & Surg. Jour., Sept. 6, 1923): Records were kept of all phases of treatment as applied in an extensive epidemic beginning in 1919. Response to treatment was better among the more well-to-do patients, where segregation and re-infection were much less, and intelligent co-operation could be better carried out than in the thickly populated foreign quarter.

Auricchio of Rome in January, 1923, published observations made on the blood of ten children who were given pertussis vaccine; these showed marked improvement in the opsonic index fairly early, while the complement fixation test did not show immunity developed until the third week of the treatment. This indicates why immediate improvement by vaccine does not usually result.

McKibben uses fresh plain or combined pertussis vaccine, injecting it deep intramuscularly into the buttock at intervals of two days. The initial therapeutic dose was one billion; the second dose, two billion; the third, four billion and the fourth dose five or six billion. Occasionally one or two more doses of equal size were necessary. Even eight or ten billion were given in older children with safety.

The duration of the disease and the severity of the symptoms were usually reduced, and the complications were much less frequent, following vaccine treatment. Infants seemed to respond to it better than older children.

Drug therapy gave the usual disappointing results.

THOS. MEYERS.

THE DIAGNOSIS OF ENLARGED THYMUS BY THE X-RAY AND TREATMENT BY X-RAY OR RADIUM—G. E. Peahler (Arch. of Ped.): Thymic enlargement is receiving more and more attention throughout the country. The roentgen ray is undoubtedly the most reliable means of diagnosis, and radiation by x-ray or radium is a specific in treatment. So general is the response to treatment, that if the symptoms do not show definite improvement after a few x-ray treatments or one radium treatment, the diagnosis is almost certainly incorrect, or the symptoms are influenced by some associated pathological condition. The classical symptoms are dyspnea, cyanosis, and an inspiratory stridor. The chief complaint is nearly

always cough or attacks of choking, which come and go, appearing frequently in paroxysms. It is conceivable that the thymus might be enlarged in thickness and not in breadth. Most of these moderate grade shadows in the upper mediastinum are due to lymphadenitis rather than to enlarged thymus. Both thymic enlargement and lymphadenitis yield to x-ray treatment. Examine the child while crying, because it is while the child cries or struggles that the thymic symptoms develop. Use a 9-inch spark-gap, 5 ma. at a focal skin distance of 30 cm., for 15 or 20 minutes, with rays filtered through six millimeters of aluminum. One may use a 9-inch gap, 5 ma. 3 mm. aluminum filter, 10-inch distance, with 3 minutes' exposure for the new-born and 5 minutes for older children. Treat the patients once in four weeks; three to five treatments should be sufficient. Heublein uses the radium in capsule with 0.5 mm. silver for filter, wrapped in gauze so that when strapped to the chest by a strip of adhesive, it will be a half-inch from the skin surface. Four marks are made in the form of a rectangle over the thymic area and the nurse is instructed to allow the package of radium to remain 2 hours over each area. This makes a total exposure of 800 milligram hours.

R. N. ANDREWS.

RESULTS OF ACTIVE IMMUNIZATION WITH NEW MIXTURE (1/10 L PLUS OF TOXIN-ANTITOXIN) TOXIN-ANTITOXIN IN PUBLIC SCHOOLS—A. Zingher (New York State Jour. of Med., Feb. 1, 1924): Zingher finds that the administration of 1/10 L plus mixture of diphtheria toxin-antitoxin produces an active immunity in a large percentage of children. The conclusions are that the 1/10 L plus toxin-antitoxin mixture is the best type of mixture to use for active immunization against diphtheria. The local and constitutional reactions with this new type of mixture are very slight and compare favorably with those noted for the older type of toxin-antitoxin mixtures containing 3-5 L plus doses per cubic centimeter. The 1/10 L plus diphtheria toxin-antitoxin may be administered to infants and older children without fear of any marked local disturbance. Three doses of 1 c.c. each are given intramuscularly at intervals of from seven to ten days. The immunization following the administration of this 1/10 L plus diphtheria toxin-antitoxin is not established until three to six months after its administration.

C. A. STEWART.

THE RECTAL ADMINISTRATION OF NEOSALVARSAN IN CHILDREN—F. Fortunata (Arch. of Ped., Dec., 1923): It is necessary to know the technique used by Modigliani for the successful injection of salvarsan in the rectum: 1. With a soft catheter he washes the rectum until the water returns clean. 2. Ten minutes before the injection of neosalvarsan, he introduces into the rectum 10 c.c. of water with 30 drops of cocaine (1 per cent), and two drops of tincture of opium to anesthetize the rectal tract which must retain the solution of neosalvarsan. After the injection of cocaine, the catheter remains in place and the outer end is closed with forceps for ten minutes; after which, the forceps are opened, and the excess cocaine is let

out. 3. Through the same catheter, 10 c.c. of double distilled water and gm. 0.15 neosalvarsan with 2 drops of tincture of opium are injected into the rectum very slowly during the child's nursing. The nursing is to prevent the infant from crying. The author found the use of cocaine unsatisfactory in these cases, but concluded it was better to stop all nursing for eight or ten hours previous to the injection, giving the child, however, small quantities of light cereal-water every two hours. The treatment with arsenobenzol is very efficacious in hereditary or acquired syphilis in children. Compared with the mercurial treatment it hastens the disappearance of the syphilitic manifestations. The administration of the arsenobenzol by rectum in infancy has the advantage over the intravenous treatment in that it is readily applicable and more practical. In order to be effective, it is necessary to administer a cycle of rectal injections, varying from five to seven days. The medicine should be injected in increasing doses as follows: minimum 10-15 c. gm. per dose; maximum 60 c. gm. in children under one year. It is necessary to proportion the dose to the weight of the body.

R. N. ANDREWS.

THE SPACE-COMPENSATING FUNCTION OF THE CEREBRO-SPINAL FLUID—ITS CONNECTION WITH CEREBRAL LESIONS IN EPILEPSY: Walter E. Dandy. (Johns Hopkins Hospital Bulletin, August, 1923.) In a series of operations for the relief of epilepsy, a number of changes were found with considerable uniformity. These were: (1) dilatation of ventricles, (2) collection of fluid on the surface of the brain, (3) pockets of fluid in the brain substance, (4) softening of the brain in association with these collections of fluid, (5) areas of induration in the brain, (6) changes in the meninges, and (7) congenital malformation. It is believed that these are evidences of actual cerebral lesions (end-products of repair), and the frequency of the findings leads to the conclusion that there is a pathological basis for so-called idiopathic epilepsy in a large proportion of cases. Confirmation of this view is obtained by means of ventriculography, which in a certain proportion of cases shows acquired or congenital distortion of the ventricles. A more detailed study of the lesions will be made at some future time.

C. A. STEWART.

OBSERVATION ON THE TREATMENT OF SCARLET FEVER WITH SCARLATINAL ANTISTREPTOCOCCIC SERUM—Francis G. Blake, James D. Trask and John F. Lynch (Jour. of the A. M. A., March 1, 1924): These investigators find that the anti-scarlatinal serum prepared by Dochez by the immunization of a horse with the scarlet fever streptococcus possesses the capacity to blanch completely and permanently the exanthem in a local area about the site of intracutaneous injection in patients having scarlet fever. This property is apparently specific for this serum and therefore is undoubtedly of diagnostic value. In addition the serum apparently possesses very marked curative properties. In twelve early cases of scarlet fever, five of which were severely toxic, administration of the serum was followed by rapid and complete recovery in

twelve to thirty-six hours. In the majority of cases a single intramuscular injection of forty to sixty c.c. of serum was given. In two very toxic cases approximately two hundred c.c. was required.

C. A. STEWART.

THE USE OF SALICYLATES PER RECTUM—George R. Irving (Arch. of Ped., Dec., 1923): The method of giving salicylates per rectum, while not a new one, was taken up in an attempt to find a more generally satisfactory way of administering this drug. At one time it was thought that it would be a fair way of prescribing the amount to be used to allow one grain per body pound weight, but he has since used in certain instances, and with safety, a grainage almost three times the body weight of certain of our patients, so that at the present it is impossible to state a rule as to dosage. The average dose has ranged from 20 to 100 grains. The author advises the use of a "baby bulb syringe," sometimes called the ear syringe, for use in administering an enema to an infant. Use plenty of vaseline about the anus and on the syringe tip in order that as little irritation as possible will be experienced in slowly introducing the inch and a half of nozzle. It is a standing rule that the rectal administration be attempted only after one hour has elapsed from the time of the movement of the bowels. He has taken the stand that the injection be held in at least one hour for its absorption, so that if expulsion has taken place within this time, he urges that the process be repeated. Salicylate in the form of sodium salicylate may be conveniently administered per rectum. Administration may be considered safe in the hands of an attendant with ordinary intelligence or without special training. Relatively large doses may be given once or twice daily. By this method of administration the stomach is particularly free of irritation.

R. N. ANDREWS.

ROENTGENOLOGY

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THE CUMULATIVE EFFECT OR SUMMATION OF X-RAY EXPOSURES GIVEN AT VARIOUS INTERVALS: Warren and Whipple. (Jour. Exp. Medicine, Dec., 1923.) In previous papers these authors have detailed their experimental methods, which consist of giving large doses of x-rays over the abdomen of dogs, producing a marked lesion in the intestines and stomach. The average maximum sublethal dose for dogs was divided into a number of fractions which were administered at different intervals. By varying the interval and the dosage they were able to determine the following facts:

1. One large dose causes a definite injury to the mucosa of the small intestine and the severity of the clinical intoxi-

cation parallels the extent of the injury. The intoxication lasts 4 to 6 days if the dose is sublethal.

2. Small, repeated doses within the 5 or 6 day period will cause practically the same cell injury and clinical intoxication as a single dose equal in size to the sum of the small doses. Doses given at an interval of more than 6 days do not show this summation but, in fact, in one experiment seemed to show some increased tolerance.

3. These results are markedly different from the cumulative effect upon the skin especially as expressed by Kingery's formula. In view of the fact that the intestine in its position is comparable to deep-seated tumors, it would seem reasonable to use the evidence adduced from these experiments as an index to the effect of x-ray dosage upon tumors, rather than to use the effect upon the skin.

LEO G. RIGLER.

ANATOMO-RADIOLOGICAL STUDY OF THE MEDIAN CARDIO-VASCULAR SHADOW AS SEEN FROM THE FRONT—L. Delhern and Robert Chaperon (Jour. de Radiologie et d'Electrologie, January, 1923): Until recently most of the classical descriptions of the radiologic appearances of the mediastinal cardio-vascular shadow have led us to believe that the right side of this shadow is produced from above downward by the ascending aorta, the superior vena cava and the right auricle; the majority of radiologists believing that the aortic shadow projects to the right beyond that of the vena cava. The left side of this cardio-vascular shadow was thought to be made up, from above downward, of the arch of the aorta, the pulmonary artery, and the left ventricle of the heart. By some the aortic hemicircle was considered to represent the descending portion of the arch and by others the first portion of the descending aorta.

The object of the authors of this valuable contribution was to attempt to dissociate the various elements in the composite shadow representing the cardio-vascular mass as seen from the front. They first made radiographic studies of the thorax of each cadaver *in statu quo* and then proceeded to render opaque the more important structures entering into the formation of the mediastinal cardio-vascular shadow. It was essential to avoid altering the relations of the mediastinal contents, and they therefore accomplished their object by injecting baryta milk through the inferior vena cava from below the diaphragm without disturbing the thorax in any way. The study was repeated on 14 subjects of different ages, and more than 175 radiographies were made.

The more important results are as follows: with respect to the formation of the right border of the median shadow, comparison of the radiographies made before and after opacification disclosed the fact that the upper part of the shadow is produced by the superior vena cava and the right brachio-cephalic venous trunk. Point D represents the termination of the right border of the superior vena cava at the right auricle. Point D¹ corresponds to the outer edge of the orifice of the inferior vena cava in the right auricle. According to the descriptions of anatomists the ascending aorta lies in the median line almost entirely hidden behind the sternum. From a study of the injected aorta in eight subjects it appears that the normal ascend-

ing aorta does not project to the right perceptibly beyond the right border of the sternal serrations or beyond the right margin of the spinal column, and in three subjects the right border of the ascending aorta did not pass to the right beyond the median line; therefore the ascending aorta does not form the right border of the cardio-vascular shadow, which is, in fact, produced from above downward by the right brachio-cephalic venous trunk, the superior vena cava and the right auricle; the aorta always lying well within the vena cava. The experiment was repeated on young subjects as well as on very old subjects in order to determine if the senile aorta can overshadow the vena cava and appear to the right of it, but, under normal conditions, even the senile aorta never projects beyond the right border of the superior vena cava, and, therefore, plays no part in the formation of this side of the cardio-vascular shadow.

With reference to the left border of the mediastinal shadow there has been considerable divergence of opinion even among anatomists, particularly about the aortic arch. Some claim there is no such thing as a descending portion of the arch and call it the first portion of the descending or thoracic aorta. According to Delherm and Chaperon the aortic hemicircular shadow is caused by the terminal portion of the arch. Above the hemicircle the upper limit of the left border of the median shadow is due to the sterno-vertebral shadow, but may exceptionally be produced by the projection of the subclavian artery in the first left interspace.

According to them the middle arc of the median shadow on the left side represents, under normal conditions, the profile of the pulmonary artery. However, in two cases in which the heart was large and transverse, the middle arc projected beyond the pulmonary artery and they feel obliged to conclude that the left margin of the pathologic auricle may take part in the formation of this border. To settle this point they injected primarily the aorta (always from below and without opening the thorax) and the left side of the heart; and secondarily the right side. They were thus able to convince themselves that the pulmonary artery projects considerably beyond the descending aorta and that it constitutes by itself the middle arc of the shadow on the left side. However, this experiment was carried out but once and they feel that it will require confirmation by clinical means. The upper border of the median shadow

is produced by the left brachio-cephalic venous trunk which joins the aortic hemicircular shadow below. They found it uniformly impossible to render the auricles sufficiently opaque to allow of accurate study.

A. U. DESJARDINS.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

SEXUAL PROBLEMS OF TODAY. William J. Robinson, M.D. 12th edition. 340 pages. New York: The Critic and Guide Company, 1923. Cloth, \$2.00.

HIGH FREQUENCY ELECTRIC CURRENTS IN MEDICINE AND DENTISTRY. S. H. Mouell, M.D. 465 pages. Illustrated. New York: William R. Jenkins Co., 1923. Cloth, \$4.00.

PRACTICAL ELECTROTHERAPEUTICS AND DIATHERMY. G. Betton Massey, M.D., Fellow and Former President American Electrotherapeutic Association; Member Philadelphia Obstetrical Society, etc. 402 pages. Illustrated. New York: MacMillan Company, 1924.

DISEASES OF THE SKIN: Frank Crozer Knowles, M.D., Professor of Dermatology, Jefferson Medical College, etc. 2nd edition, thoroughly revised. Lea and Febiger, Philadelphia and New York, 1923.

The number of text-books on Dermatology by American authors at the present time, compared to those of twenty years ago, has grown considerably.

Among those appearing in later years, that of Knowles stands out as a very useful and, for its size, a very comprehensive work.

While there has been considerable advance in knowledge in recent years in respect to diseases of the skin, there is unfortunately much still obscure both as to etiology and treatment. The reader, however, of this book will find the latest information on the subject concisely and clearly stated.

The work is well illustrated and the number of illustrations we have in this issue which are not in the previous one certainly adds to its attractiveness. The reviewer feels that the book may be recommended to all who wish a concise, practical and sound work in dermatology.

J. M. ARMSTRONG.

Mrs. Christine Lund of Hutchinson, Minnesota, offers for sale complete office equipment of the late Dr. Theo. C. Lund, physician and surgeon. Surgical instruments, scales, safe, desk (McCaskey's system), sterilizer, etc. Equipment in good condition. For information inquire of Citizens Bank, Hutchinson, Minn.

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Luse, Horatio Devol.....	Hah. Chicago, M. D., 1911.....	1214 West 32nd St., Minneapolis.
McElroy, Jesse L.....	Ind. Med. Coll., M. D., 1907.....	Ancker Hospital, St. Paul.
Robertson, Paul Augustus.....	Med. Coll., Va., M. D., 1921.....	Austin, Minn.
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Northern Minnesota Medical Association and Minneapolis Surgical Society*

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ORIGINAL ARTICLES

CLINICAL CONTRASTED WITH INSURANCE OPINION OF AN INSURANCE APPLICANT*

J. ALLEN PATTON, M.D.

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Company of America
Newark, N. J.

The word clinical means, in its restricted sense, the observance of the symptoms and course of a disease as distinguished from the anatomical changes. The clinician or practicing physician, differing from the pathologist or laboratory man, does much more than this, for he sees his patients at the home or in an office, a dispensary or a hospital. He obtains the previous health history, usually from a willing and helpful patient; he makes whatever physical examinations are necessary or that the facilities at hand afford; he notes the appearance and records the anatomical or physical changes found; he adds the results of the available indicated laboratory tests; he sees and re-examines his patients more than once, often repeatedly; he refers to his text books and journals and frequently obtains consultation; he applies treatment of various kinds, watching the effects; he makes his diagnosis and prognosis and these, with the treatment, as we all know, may change from time to time for various and justifiable reasons.

The prognosis is of two degrees or kinds, immediate and remote. Will the patient recover from the present attack completely, or will his recovery be incomplete with more or less, permanent ill-effects upon his health? Will he have a slow or delayed, but ultimate full recovery? Here again the clinician has the advantage of repeated observations or examinations and almost unlimited time in which to reach a conclusion and give his opinion.

During all this it is to be remembered that the patient is doing all he can to aid his physician.

The insurance examiners—and the best of these are found in the ranks of good clinicians in the everyday practice of medicine and surgery—meet an entirely different situation. We will all admit that the ideal place for an insurance examination is at the examiner's office, but this cannot always be arranged and it is needless to recount here the reasons why.

Thus many times the examination has to be made in noisy, unsuitable surroundings. There is no privacy, he is unable to remove sufficient clothing to permit of proper chest or abdominal examinations and he cannot verify the weight. There is insufficient time, because the applicant is too busy or has not been sufficiently sold by the soliciting agent.

Additional to these difficulties, though many applicants tell all they know about their previous health history or their present signs or symptoms, thereby aiding the medical examiner to furnish a pen picture, together with his own conclusions, there are, unfortunately, all too large a number who use their intelligence to the limit to prevent the examiner from learning about any previous conditions that might have unfavorable effects upon their obtaining the insurance requested, and numerous others in some manner have discovered methods of temporarily relieving or causing to disappear signs and symptoms that might give rise to an unfavorable opinion in their case.

We can, therefore, all of us, readily see that the insurance examiner, in the short time he is allowed in which to make his examination—often in inconvenient and unsuitable surroundings and frequently without the aid, if not with the direct antagonism, of the applicant—has a much more difficult problem than the clinician to obtain and set down in connected form the information for a case history. Those supposedly healthy or well are probably the only ones who unreservedly submit themselves for insurance examinations.

*Read at Fourth Annual Clinic Week, Ramsey County Medical Society, St. Paul, January, 1924.

The expert or well-trained clinical diagnostician will find early or prodromal signs that might escape the general practitioner; but the latter, who has been endowed with good general common-sense and has trained his powers of observation along physical examination lines, will usually recognize significant changes even in their incipency.

Inspection or observation is one of the most essential features in the training of both clinician and insurance examiner, and the best results are obtained by those who have best developed this faculty.

Personal knowledge of the applicant or his family and his living conditions should aid the examiner in his report and, be it said to his credit, the honest physician responds to the trust placed in him by the company for whom he is rendering a report.

Honoring, as I do, and as any reasonable individual must, the sacredness of the trust imposed upon a physician in his dealings with a patient, is there not a still more sacred duty imposed upon the profession when the question of the greater good to the many opposes that of the individual? An applicant for insurance, be he examined by his personal physician, an acquaintance or a stranger, by that application agrees to give such information as he is able, and when he states that he has been under the care of or received advice or treatment from a physician, he, by that admission, has released that physician from his personal obligation. Therefore, I would prefer in the average case to have the examination of the average physician who knows the applicant to that of the higher-trained man to whom the applicant and his personal history are unknown. The questionable applicant (probably one in four) who may try to conceal his history or physical abnormalities, can undoubtedly be best examined by the best trained physician so far as physical examination and diagnostic conclusions are concerned.

Insurance medicine is founded upon case histories (personal and family records), physique (height, weight and trunk measurements, with changes in weight), age, occupation, race, sex, marital state and physical and laboratory findings. The Home Office Medical Department must take these records, study them carefully and place the applicant in a group made up of as nearly similar individuals as they can, and from the results obtained by insuring previous individuals in such a

group estimate the probable longevity or give the insurance (remote) prognosis or the effect upon the length of life.

Briefly, we might state that insurance premiums are based upon actuarial calculations as to the amount of money (premiums) that must be collected during the estimated length of life of the individual to enable the company to pay the expenses incidental to obtaining the application, making the examination, issuing the policy, supervising the business and paying the claim. Based upon normal death rates for various ages, the deaths per year are calculated for groups of a thousand and confirmed by many thousands. Some members of these groups die early, or before the expected period, and some outlive that time, hence the average. Variations from the average, due to variations from normal health histories or physical findings, make necessary various types of policies differing from the regular or standard policy, and in those that cannot be classified or that cannot be covered by a reasonable rating a rejection must be made. The group basis, therefore, must supplant the individual in insurance prognosis and thus another difference arises from the clinical viewpoint. The mathematical accuracy of the study that has been made of life insurance records has enabled the companies to offer, during the last few years, insurance to many an individual for whom no adequate rate had been made and whose insurance would, therefore, have been at the expense of the standard risk, or he would have been declined.

We find that many of the differences that exist, start from the practical everyday experience of the practitioner with his patient as contrasted with what the future has in store for that patient, based upon life insurance records of their experience with the large mass of people the companies have on their books.

Occupation is healthy or unhealthy in the minds of the average man as he sees the effects upon his acquaintances or neighbors or as he may occasionally read a newspaper or magazine article. Quite general, but indefinite, ideas prevail about the increase above the normal average of a community of impairments or deaths that are due to the iron and steel mills, mining (coal and metal), lumbering, railroading in its various branches, textile mills, hat factories, duties of peace officers, or hundreds of other occupations. All these have had their records kept and estimations have been made show-

ing how they compare with the average death rate, and insurance is granted accordingly—not upon the individual case.

The medical knowledge of the field examiner is needed to recognize and record any changes from the normal that he detects and the effects of these changes must be considered with various other features in the insurance summation.

Consideration of the habits of an individual in insurance was ordinarily limited to the use of alcohol of the ethyl chemical type and the effects of varying amounts used intermittently or daily, slightly or to intoxication, had been quite well determined for insurance purposes if not from the ordinary physiological or pathological standpoints. Agreeing that the differences in individual resistance are probably shown as well in the effects of alcoholic beverages as of anything else, still the mass results from histories recorded cause the classification into insurable or not insurable, and the exceptions cannot be made that the clinical observer thinks should be. The effects of modern intoxicating liquors are better known as yet from individual instances, but present indications are for worse effects than formerly.

Family history plays an important part in life insurance. No matter how much we may read or think pro or con on the subject of heredity, each of us sees every day children who show enough of the ancestral characteristics to make us believe there must be inherited disease tendencies as well as mental and physical traits. Thus the histories of apoplexy, paralysis, circulatory diseases, diabetes, tuberculosis, early deaths and many other points in the family history all call for care, either because of these records alone or in connection with personal health history or the physical findings.

Personal health histories have their value increased by family histories, age, sex, occupation, physique and the examiner's physical findings.

We are all aware of the possibilities of serious developments after slight superficial injuries, mild colds, digestive upsets, etc., and while the probable effects are usually belittled to the average patient the true physician also cautions his patient to take common-sense care of himself until the mild ailment has disappeared as most of them do. Life insurance cannot disregard the presence of these abnormalities because of the occasional case that goes wrong; hence, as a rule, final action is deferred until receipt of an examiner's statement that

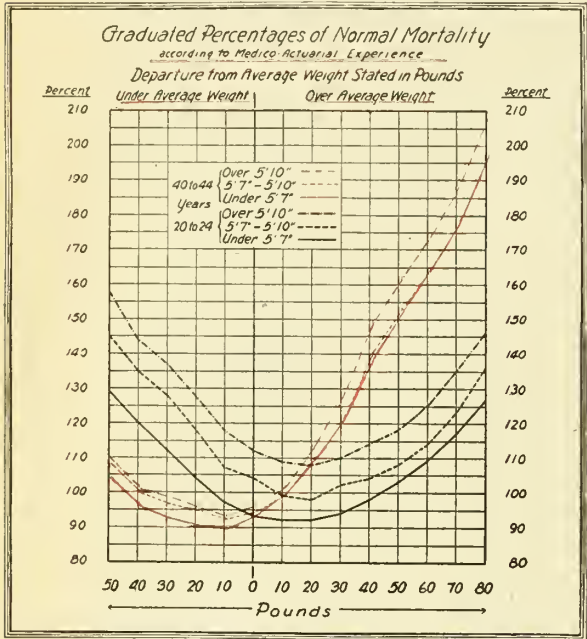
full recovery has resulted, or approval may be taken requiring a favorable health certificate before the policy can be delivered.

Statements of present conditions should not be vague or diffuse, but must be definite enough to enable the medical reader of the case history to formulate a legitimate opinion based upon ordinary medical practice, supplemented by his training in the use of insurance standards. Such a statement as "cold for the last two weeks" may mean nothing of any moment to the examiner and it may mean any of numerous possibilities to the home office reviewer. Serious illnesses or surgical conditions present, or histories of such past troubles, call for rejection, postponement, or an action depending upon their character or severity and the prognosis of the immediate and ultimate outcome. This statement from an examiner of large experience: "Cystoscopy showing irritation of one kidney? Cured by large quantities of water," may have been sufficient for him with his other knowledge of the case, but we were not furnished dates, symptoms, duration of treatment, microscopic urinalysis, etc., and, therefore, had insufficient information to form an opinion on the future of the individual. A report received in December, 1923, of "Gallstones and drainage in 1921, prompt recovery and all right since," would do for a medical or surgical opinion for the immediate future, but clinical and insurance experience shows that the probability of recurrence of gall stones or gall bladder troubles is based upon the time since symptoms or operation. What month in 1921 did this operation occur? If in January then practically three years had elapsed by December, 1923, but if in December, 1921, only two years had passed. The clinical examiner found the case all right but he failed to complete the history for use of his medical director. Such instances could be multiplied indefinitely but they would only serve to emphasize the insurance need of enough facts to give a proper picture of the applicant, thereby allowing legitimate application of medical life insurance experience in the proper placing of the individual case.

The reported physique of an applicant is one of the chief troubles of the home office, and yet it should be one of the easiest parts of an examiner's report to record the figures so that there could be no doubt. Weight in ordinary street clothes, minus overcoat, height in ordinary street shoes, and chest and waist measurements under the vest should be

readily and accurately obtained. The only figures about which there might be any uncertainty are those for weight, as scales are not always at hand.

Mortality According to Height and Weight



Here, if there is any doubt in the examiner's mind, or if the case is materially below or above average weight, special comment should always be made to show that the examiner has noted the abnormal weight.

Physicians, because of their professional training, are quite positive usually of the results of their personal observations. All will admit that overweight is an impairment, that abdominal girth greater than expanded chest is a handicap to long life, that soft or flabby flesh is not a good sign, yet we each know of so many persons of these types that live to old age that we are prone to disregard them in practice and only strive in a half-hearted way to instruct these persons in improving their physique, unless some direct complaint is

traced to this as a cause. Height and weight taken in connection with age have probably more definite data than any other phase of insurance selection, hence there is here a sound foundation for action. Year by year of age and almost pound by pound of weight the records have mounted so that the classification can be made with great exactness.

The accurate verified height and weight is, therefore, most important in any case more than 20 per cent over or under the average for age. Group classes must be formed and even 1 or 2 pounds may mean the difference between standard or rated insurance or a rejection.

The American Experience Table of Mortality gives, for a given age, the number of deaths that are expected per 1,000 during the next year. Any increase over this expected number means an unestimated loss to the insurance company, unless their policy has been issued to cover such an increase.

The effect of age upon height and weight can be illustrated by taking the two groups of 20 to 24 years and 40 to 44 years, as shown in the chart.

Height makes a difference, the greater mortality rate being shown by the taller persons. Those under 5 ft. 7 in. show a lower and those over 5 ft. 10 in. a higher mortality. A brief glance at the table below should convince anyone that insurance must take account of age, height and weight in the calculation of a premium rate. Mortality percentage as compared with 100 per cent is calculated.

Very frequently reports are received that the applicant has occasional digestive (gastric, intestinal or biliary) disturbances, but that they do not keep him from his occupation for more than a day or two; there may be a rheumatic history without definite symptoms or the statement that it was articular in type; attacks of disturbed breathing upon slight exertion; of rapid heart action or palpitation; of feeling tired after ordinary or regular daily routine; slight loss of weight without climatic or

Height group 5 ft. 7 in. to 5 ft. 10 in.														
Underweight						Weight	Overweight							
Pounds	50	40	30	20	10	0	10	20	30	40	50	60	70	80
Ages	%	%	%	%	%	%	%	%	%	%	%	%	%	%
20-24	145	135	128	118	107	104	99	98	102	104	108	114	123	136
30-34	125	113	109	103	98	97	96	100	111	119	127	136	146	161
40-44	107	99	96	94	92	94	99	109	121	140	152	164	177	197
50-54	94	89	88	87	88	95	102	113	120	132	144	157	169	186

occupational cause; pleurisy may be mentioned but no particulars given; suspicious of specific infection with history very indefinite, etc. Such cases are very often properly rated by the examiner as first-class so far as his findings at the time of examination are concerned and he frequently so informs the applicant and many times the interested agent; but, lo and behold, a request comes from the home office for more information or, in some cases, the application is declined or a policy offered with an increased premium.

The insurance case requires definite records of parts of the body affected, primary and secondary, the date or dates of attacks, duration of illness or period in bed or house and the following stage of convalescence, severity of symptoms, complications present and degree of recovery. Acute attacks, from which recovery is usually prompt and complete, are much more preferable in life insurance work to indefinite or chronic indispositions, whose histories are often incomplete but whose causes are hard to determine and are frequently of serious systemic character. These indefinite recurring mild indispositions are warning signs in insurance selection and should be in clinical or practical medicine, especially after age 45 to 50 has been attained. Here lies the field of preventive medicine and the physician can do much for the health of his local community, his state and his nation, by preaching and practicing regular physical examination of his patients, to be followed by sensible regulations of work, diet, rest or recreation for those showing indications of feeling the strains of life, and the recommendation of medical or surgical treatment for those needing the same. Most physicians would find their incomes as large as at present, but it would come from a more satisfied clientele for they would have been kept well instead of being treated after becoming ill. In our opinion, the periodical health examinations being offered by insurance companies to their policyholders—as in the Prudential Longevity Service—can be made most effective by working with the policyholder's own physician, for thus he is kept in touch with the doctor, who has more personal interest and who is able to extend advice and supervise treatment that will benefit the individual the most.

Some of those present will recall the results of a study made a few years ago of the Mayo Clinic digestive ulcer cases. These showed better results for duodenal than gastric operations after the sec-

ond year and until the sixth year, when the mortality was found to be practically the same as for persons of the same ages without any such operations. We are receiving many applications from ulcer cases (medical and surgical) and they are almost all reported in first class condition of health, but we cannot insure them at regular rates unless in our opinion sufficient time has elapsed. The number of these cases we have taken during the last three years indicates that after five to ten years' experience we can tell more of the remote prognosis in the average case than we are in a position to do now. This information will be of service to the general physician for many of the cases being insured were treated by him and not in our large surgical hospitals or centers.

Syphilitic infections are so prompt in the disappearance of cardinal secondaries under modern treatment that more histories of doubtful character are received than formerly, but advantage must be taken of suspicious cases, for past records show a large mortality in such cases presumably because treatment was discontinued too soon. Treatment with salvarsan or its similars, followed by mercurials, is considered the legitimate method and a Wassermann check is advisable from time to time, especially if any obscure train of symptoms arises. Such a course of treatment, with negative Wassermann and the patient in good general health, causes the physician to advise his patient that his disease is arrested or cured and that with due care he can engage in a regular or active business life. Insurance experience shows that a negative Wassermann means no sign of active syphilis was found in the blood specimen examined and any number of negative Wassermans, in our opinion, prove that the patient has received and reacted to proper treatment, but any company that accepts such cases at regular rates will pay an undue number of early claims. Syphilis cases properly treated are insurable but not at regular rates.

Diabetes is a condition that causes the clinician and insurance office much trouble. A disease which caused 17,000 deaths in the United States, as this did in 1922, and which is reported as increasing, must have many victims in the incipient and active stages. Probably as much has been written about this disease as any other in the medical and lay press during the last year or two. The physician has here, by the various kinds of treatment, especially diet or starvation and now by the use of

letin (insulin) and the education of the public, one of the best conditions in which he can improve his patients' health, but experience proves that the vigil must be closely maintained. Insurance experience shows that once a diabetic always a diabetic, and our problem is to determine whether the applicant whose urine shows glucose or whose history shows a former glycosuria or a suspicious train of symptoms, is merely an individual of low sugar tolerance, a pre or potential diabetic, or an actual active case. Methods of urinalysis and other means of examination are becoming so perfected that efficient protection is being offered insurance companies and the true diabetic is rarely considered an insurable risk at standard rates.

Urinalysis is one of the laboratory methods in which medical students have been quite thoroughly drilled and if, as in many instances, this instruction has been followed by a hospital internship the training has been such that physicians should make dependable qualitative examinations of urine specimens as they are secured from patients or from life insurance cases.

Why is it that so many insurance specimens, when checked in a local or Home Office laboratory, give different specific gravities or albumin or sugar reactions than those reported by the field examiners? Various theories have been advanced and I suppose mine is as good as another's. I believe the average practitioner is able to make a reliable qualitative urinalysis, but I know many of them do not as insurance examiners, and I think haste or carelessness is the reason for this. Fifteen years close association with Professor Walter S. Haines, one of the best teachers of medical students this country ever had, gave me an insight into methods of instruction in our better medical schools. Experience the last fifteen years with practitioners as insurance examiners and for over thirty years with clinicians has shown how rapidly the average physician falls away from the laboratory methods and technique he was taught in school. Many of his simpler cases he carries along without any laboratory tests and with the others he has become quite dependent upon hospitals, laboratories or public health departments.

Many of the insurance companies have established a central or Home Office laboratory for the examination of specimens of urine from their questionable cases. Thus they have a uniform method or standard by which these cases are judged and

all are treated alike. Our own laboratory so handled 40,000 specimens in 1923, not because we doubted the ability of our examiners but in order that we might take advantage of one standard instead of several thousand, as would have been the case had these examinations been made by our field examiners.

The clinician will always be necessary in the healing of the sick and more and more in the prevention of sickness, but if he has received nothing else from life insurance medicine he has been taught the value of blood pressure and the methods of taking it. Life insurance has furnished the only large collection of blood pressure reports on healthy men; it has shown that blood pressure increases with age or with weight, and that weight increases with age, but that the most increase in blood pressure comes after the age of forty. The blood pressure is affected by methods of living, eating and the use of alcohol, for the average dropped during the restricted diet of the late war and began to rise again in 1920. The records show that both systolic and diastolic rise with age and weight, but the systolic rise is greater than the diastolic, hence the pulse pressure also rises. Systolic readings above 140 mm. or diastolic above 100 mm. or pulse pressures below 30 mm. or above 50 mm. should be considered as danger signals in life insurance. Insurance records are reliable for people in average good health and they are taken with the applicants in a sitting position, usually during the course of their regular daily routine of living.

Addis (Arch. Int. Med. 1922) claims there is a striking difference in blood pressure taken before rising in the morning and after the individual has been up and around or later in the day and that the normal average of daytime measurements cannot be taken as a standard for patients who are standing or sitting up or exercising.

The insurance averages are made from records taken during the time the people are under the strain that tells and, therefore, they are the fairest to use as a basis for prognosis. Food, exercise and excitement all affect blood pressure, but not enough to interfere with life insurance for a healthy risk. If the observation is too high and remains so after eliminating any nervousness over the examination it will rarely come down without treatment.

Mr. Arthur Hunter, Chief Actuary of the New York Life Insurance Company, at the 1923 meet-

ing of the Association of Life Insurance Presidents, stated that the higher the blood pressure above the average the greater the mortality above the normal, and that persons with a distinctly high pressure are prone to develop diseases of the heart, blood vessels and kidneys, the mortality from heart disease, apoplexy and Bright's disease being very high among them. He further concludes from his observations and calculations that "Blood pressure is the same throughout the world under like conditions." It is principally affected by the kind of diet and the quantity of food, simplicity of living and freedom from nervous or physical strains having a beneficial effect. He believes that a reduction in blood pressure of Americans in the United States would result in greater longevity, that a better adjusted diet, containing less animal food, would result in a lower blood pressure and in greater longevity with an equal ability to carry on their various occupations.

I know of nothing better to close this brief and all too incomplete discussion than to quote the words of one of the leading Medical Directors of this country, Dr. Brandreth Symonds, Chief Medical Director of the Mutual Life Insurance Company of New York, who concluded his paper on blood pressure at the Thirty-third Annual Meeting of the Association of Life Insurance Medical Directors in 1922, as follows:

"Probably life insurance and general medicine will never regard blood pressure in the same light. Life insurance sees only people who are healthy or at least think they are. Even the highest pressure of fat elderly people is below 140 mm. on the average, if they are acceptable for life insurance. This also means that practically as many are below 140 mm. as above and we have seen that of those above 140 mm. nearly all of them are below 150 mm.

"General medicine on the other hand sees those who feel that they are sick. If their illness is due to blood pressure, it is usually high, frequently as high as 200 mm. or more. General medicine knows that these high pressures will come down to 170 mm. or 180 mm. by appropriate treatment and many of them live for years. There are examples among our own associates. But medicine does not realize that a small increase in the number of deaths per year means a great difference to life insurance. At age 50 we only expect 14 to die in the following year out of 1,000 living and we call that 100 per cent mortality. If 28 die, our mortality jumps up to 200 per cent. At age 60, if the number of deaths among 1,000 living increases from 26.69 to 40.04 the mortality increases to 150 per cent. If a practitioner should see 1,000 patients with high blood pressure at age 60 and bet with himself that 974 would survive the year and only 960 did survive he would not feel downcast; in fact, he would probably point to the record with pride and boast of his ability in prognosis. But life insurance would have to tell him that his mortality was 150 per cent in that group and a medical director who never made a better guess than that would not keep his position for long. General medicine would look complacently at the living, but life insurance would ruefully regard the dead, for forty claims would have to be paid instead of the twenty-six expected."

TULAREMIA (?) IN NEW YORK STATE

The appearance of a number of diseased wild rabbits in a western county of the State has been brought to the attention of the Division of Laboratories and Research. It was thought that there might be an outbreak of tularemia among these animals and steps were immediately taken by a local laboratory in that vicinity to obtain information concerning the examination for *bacterium tularense*.

The disease has been studied intensively in Utah, where it became quite prevalent among the farmers, incapacitating those infected for two or three months, frequently at the harvest season. Recently workers of the Hygienic Laboratory in Washington reported the finding of cases of the disease in infected rabbits in California, Utah, Wyoming, Idaho, Colorado, southern Indiana and Ohio, Tennessee, North Carolina and Washington, D. C. So far as is now known, this disease is confined to the United States. In New York State no report of cases suspected of being tularemia has been found. More is being heard of this disease, however, from other parts of the country, and it is important to be on the alert to prevent its introduction and spread in this State—especially among jack-rabbits and squirrels. The etiological agent may be transmitted from these infected animals to man by handling and dissecting such animals or by the bite of an insect. Francis, who

has made an extensive study of the disease, reports that blood-sucking flies, stable flies, rabbit lice, mice lice, squirrel fleas and bedbugs can carry the *bacterium tularense* from animal to animal.

The clinical picture of seven cases of tularemia in Utah was summarized by Lake and Francis of the United States Public Health Service as follows:

"All seven had a sudden onset of illness with fever, closely following an insect bite, which became the site of suppuration and which was accompanied by a consequent unilateral suppurative lymphadenitis of the glands, which immediately drained the bitten area. The constitutional disturbance was severe, as indicated by febrile attacks which lasted from three to six weeks and which were followed by slow convalescence. *Bacterium tularense* was isolated from the suppurating lymph glands in five cases and from the blood in two. Serological tests were positive for complement fixation and agglutination, using antigens composed of cultures of *bacterium tularense*."

The extremely infectious nature of the disease has been demonstrated by the fact that six laboratory men who were closely connected with the investigation of tularemia contracted it. This led to the adoption of a regulation in the Hygienic Laboratory in Washington which prevents cultures of *bacterium tularense* being sent to any institution. —*New York Health News*, Vol. 1, No. 7.

MEDICAL EXAMINERS' RELATIONSHIP TO THE COMPANY AND ITS BEARING ON MEDICAL SELECTION*

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The practitioner frequently is of the opinion that the physician who devotes his entire time to the medical work of a life insurance company occupies an isolated position so far as contact with fellow members of his profession and opportunity to orient himself with the progress in medicine is concerned. He ventures his opinion without an understanding of the medical director's true environment.

My work during the past twenty years has afforded me the utmost satisfaction in the opportunity which I have had both for personal association and correspondence with not only examiners representing my company during that period but the contact into which I have been brought in various ways with the pure clinician or advanced research worker in medicine. I accepted your Chairman's very kind invitation because of the opportunity which it will afford me to enter into intimate contact with the medical representatives of my company in this territory and the opportunity which it will afford me to meet the scientific practitioners of this locality in general rather than in the hope of being able to say anything to you which might be of very great interest.

Occasionally one receives the statement from an examiner with regard to a particular risk which gives the impression that the examiner considers himself the only factor in selection, and because he considers the impairment in question either of very great moment or of no importance—his opinion usually depending upon his personal experience with a varied number of cases—that the company in its action should depend absolutely on his expression of opinion. It should always depend in a very large and I may say major measure upon his opinion with regard to the insurability of an applicant, but there are certain other features which are to be taken into consideration in order to attain a proper balance in action.

The insurance business is based on the law of average. The exposure in the experience of any

company is vastly greater than can be that of any clinician and consequently must be the guide in evaluating any favorable or unfavorable features rather than the experience of an individual practice. Upon this in my opinion is based the very considerable difference between so-called life insurance medical viewpoint and the clinical viewpoint.

Hardly a day passes but I have occasion to wish that some examiner or attending physician who informs an applicant or the agent representing that applicant that he is of the opinion the applicant will attain his full life term notwithstanding some granted physical impairment, which throws the applicant into a class the experience of which I know will be decidedly unfavorable, could have had an opportunity to read and digest this statement of Dr. Symonds.

Nevertheless medical examiners are the keystone of the arch in selection by life insurance companies. Other factors of selection work either for or against the success of a company which in its final analysis means the protection of the savings and investment which the individual policyholder has intrusted to the company. Selection by the medical examiner in making accurate physical examinations, solicitation of accurate personal and family histories and the expression of opinion as to the viability of the risk as a whole operate always to the success of a company provided the examiner is competent and conscientious and surely no larger proportion of any group of men is so constituted than is the case in a group of physicians acting as examiners for well operated life insurance companies.

Selection against the company consists first upon the so-termed self-selection on the part of an applicant. Occasionally it is with definite evasion and definite intent to defraud. More frequently it occurs even subconsciously on the part of one who does not feel up to par, who assigns no reason for his untoward yet minor symptoms except that he perhaps attributes to increased age more importance in the change in his feeling of well-being than is its due, but just naturally feels that he had better get as much coverage as possible while the opportunity is still present. Selection on the part of the agent may operate either for us or against the interest of a company and its policyholders, depending upon whether an agent is loyal to the welfare of his company or on the other hand his interest in his present commission entirely overshadows not only his interest in the welfare of the company and

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of the policyholders which he has been instrumental in placing on its books but his future or permanent standing with the company as well.

While a home office has an additional aid to selection in its tabulated experience, the features previously referred to constitute selection so far as the field is concerned.

The field examiner is not concerned with how risks shall be classified or acted upon at the home office. He is depended upon to present a true picture of the applicant's physical condition as found upon careful examination and to obtain an exact record of the applicant's personal and family history. With this picture the home office is able to properly classify the risks presented to it. The field examiner is, consequently, not in a position to assure an applicant or the agent as to what will be the company's action on a given case.

In making examinations he is expected to display tact and ability to meet the applicant on his own ground, so to speak, so that he may be at ease. This is not solely for the purpose of being agreeable to the applicant but also because one when at ease is most apt to give a fair statement.

An apparent lack of frankness on the part of the applicant may lead to the necessity of an examiner availing himself of decidedly searching questions, put from various different angles, in order to develop the truth to which the company is entitled before acting.

An examiner is not only justified in going beyond the questions on the blank, but is expected to do so provided the course of the examination develops anything which arouses his suspicion, and such action is not criticisable.

Examinations conducted in a too routine manner are not looked upon with favor. Short of drawing on the imagination, which I am satisfied good examiners never do, an examiner cannot be justly criticised for thoroughness in the matter of examinations.

So-called borderline cases receive favorable consideration at the hands of the home office medical officers when examined most thoroughly and conscientiously and to an extent which would not be possible if we accepted superficial examinations.

Examiners are selected and employed on the basis of their professional qualifications. Their adaptability is important but secondary. A competent diagnostician even though he be a crank in his relations with men is preferable to a weakling

in medicine even though the latter be as full of sunshine as a day in June. A combination of competency and sunshine is of course much to be desired when obtainable and that agent so situated that he has an opportunity of working with such a counsel of perfection is indeed fortunate. Perfection, however, is difficult of attainment.

Although the field examiner cannot render a decision as to the proper class in which an applicant should be placed, the home office action in this respect is based, so far as the medical aspect is concerned, upon the findings of the examiner so that one is entirely correct in stating that he is the most important factor in home office selection and the most important single contributing factor towards a satisfactory mortality upon which the success of a company and the protection of its policyholders depend.

It depends upon the home office medical department to maintain in the field its medical organization at the highest possible standard, appointing only examiners who are competent diagnosticians, painstaking and accurate and who will render true and accurate reports without fear or favor. Such a corps of field examiners can be maintained only in case its members can believe that they will be supported by the home office and its field representatives when they render good medical service in its most essential element, that is, assistance in medical selection.

The very necessary sense of loyalty to the company cannot be felt by its examiners unless they are able to feel that they have the support of the company when they conscientiously perform their duties in connection with medical selection.

If an examiner feels that officers responsible for the appointment and continuance of examiners attach undue weight to complaints made against them which are not true in fact but which consist of an enlargement of trivial matters made because a solicitor has taken exception to the company's action and holds the examiner responsible when he is only responsible in so far as he has done his duty in reporting the facts as determined, that examiner will lose his sense of loyalty and either decline to serve the company further as inconsistent with his ideals if he is a man of honor, or, if his ideals are not high, become less thorough and competent—either of which results is deplorable.

An examiner whose vision is broad can be of assistance to the selling force in many ways with-

out lessening in any way his value in the field in which he is essential, that of selection. However, he must never let his desire to accommodate interfere in any degree whatever with the really vital service for which he is employed, that of making competent examinations.

An examiner should never have cause to believe that continuance of his services is dependent upon any other than loyal and intelligent service.

We are all human, even we doctors, but I sometimes think that we should be more human than others because of our opportunity to observe the frailties of human nature and consequently should be less inclined to take exception to any unfairness. Still it is the natural inclination of the human mind to react to unjustified accusations by an indifference to the rights of the accusers.

I am satisfied that the agent who meets an examiner half way in the matter of the many accommodations which may enter into their relations aside from the matter of pure medical selection attains a much greater success in the handling of his business and enjoys his life of freedom from friction to a much greater extent than does the agent who looks upon an examiner as a necessary evil whose functions are to be considered on a low plane and to be overridden when possible. Suspicion breeds suspicion. Examiners and agents succeed in their relations when they meet on the ground of gentleman to gentleman.

Medical selection in so far as it refers to the physical condition of the applicant at the time of examination affects the mortality results for a period of perhaps five to six years from the date of issue, as by the end of that time a group of selected lives will have reached about the same physical condition as a group of applicants. Medical selection may influence the mortality to a certain extent for a greater period by giving due consideration to family and personal history as these are matters of history already sustained and with a consequently fixed value instead of being matters of possible future development as are physical impairments which may be found upon examination.

The work of the medical department begins with the examination of the applicant by the examiner in the field, which constitutes the first consideration of the insurability of the applicant by the company after solicitation on the part of the agent. The field examiner is depended upon to examine the applicant thoroughly, to report to the home

office a correct picture of his physical condition and to obtain complete and accurate information as to personal and family history. The examiner must be a competent physician gifted with the power of keen observation and must be trusted to observe any material conditions as regards surroundings, the results of improper habits and any factors which may bear upon the insurability of the applicant.

In many companies, including my own, the medical examiner's report of examination is forwarded to the home office direct by the examiner without passing through the hands of any agency representative. This plan is followed for the reason that the physical condition and personal history of an individual is a confidential matter, that knowing this he is more willing to enter into detail with the examiner with regard to personal and family history and that the examiner may not be subjected to criticism or pressure on the part of the interested agent because of findings obtained by the examiner since the agent is not made aware of the findings. Better work is consequently done by the examiners, and examiners have a very deep appreciation of the correct attitude of a company which deals with the matter in this way. This plan also lessens materially the amount of correspondence between the agent and the home office as regards the reason for the company's action in a given case.

An important feature in examiners' relationship to a company is its selection of examiners who shall represent the company in their communities, make satisfactory examinations, be both businesslike and professional in their relations with agents and applicants and at the same time always remember that their duty to the company requires that they report all material information to the company. In order to secure loyalty to the company and interested services on the part of examiners it is always necessary to sift to the bottom all field complaints regarding examiners so as to determine whether or not they are justified by the facts or dependent upon personal feeling upon the part of agents or applicants because of a necessary unfavorable action taken by the company on business previously submitted or because of personal dislike or differences between the examiner and the agent over matters not related to the business of the company. Examiners and agents are both apt to be men of strong character and as such frequently differ.

It may seem that one goes beyond the title of

this paper in mentioning the subject of the medical director but upon him depends so largely satisfactory or unsatisfactory relationship of the examiner with his company that I trust you will bear with me when I express some of my views of his necessary qualifications. He is brought into the problems of the field representatives and solicitors through correspondence and personal contact and must be able to instill a belief in his professional ability and fair-mindedness when called upon to settle questions which arise in connection with the efforts of solicitors. He must not permit himself to become unduly suspicious and antagonistic and it is frequently necessary for him to weigh the determined facts until he can obtain a true idea of the facts in connection with any complaint which may be made to him by the company's agents with regard to examiners or by examiners with regard to agents, yet this should always be undertaken with the intent to do justice to those concerned and not in the hope of fixing the blame on anyone in particular. This is very necessary in order that examiners in the field and agents as well shall have complete confidence in the medical department. Personal contact between examiners in the field and the medical director and his assistants by means of visits to the field and visits to the home office by examiners located at important points serve to co-ordinate the work of the home office medical department and its examiners in the field to greater degree than can be accomplished by other methods.

Occasionally complaints with regard to examiners are made by agents shortsighted as to their real interest to the effect that competent examiners are incompetent because of agency reasons. It may happen that an examiner very competent medically may be decidedly criticisable from a business point of view. Before such an instance can be admitted, however, the medical director must be assured that such is in fact the case and that the examiner is negligent of the company's interests and not the victim of allegations resultant upon his having given satisfactory medical service. The loyalty of examiners to the home office which is essential cannot be maintained unless unjust criticism of them will not be recognized. A mutual and entire confidence between the home office medical department and the field examiners is an absolute essential.

It has been interesting to me, and I thought it might be to you, to note how much of the time at

its annual meetings the Association of Life Insurance Medical Directors has seen fit to give to the subject of medical examiners and matters relating thereto since its organization. In its first fourteen years five addresses were made on the important subject of the medical examiner out of a total of twenty-five subjects discussed and the character of the work of the medical examiner entered as a basis into the development of the facts brought out in the remaining twenty papers. The subject has frequently been carefully covered in recent years and only a year or two ago a highly scientific medical director with an actuarial turn of mind conceived the idea that there might be a relationship between the mortality of the risks accepted in his company year by year and the percentage of negative answers by the examiners as to recommendation in each given year. Or perhaps it might be better stated that an increase in proportion of the risks not recommended by the examiner but accepted after postponement or various other modifications materially increase the general mortality, and vice versa. The discussion of this paper grew to be largely actuarial for the reason that those of us without actuarial information could not well comprehend it in its entirety. There is no doubt, however, in my mind that the doctor's premise was logical. The amount of work undertaken by him and by others at various times serves to indicate the importance and value of the medical examiner in his relationship to his company.

The medical section of the American Life Convention has also devoted a very considerable portion of its time to the matter of the medical examiner and his work.

Life insurance has become one of the bulwarks of the nation, permitting millions to exist with the comforting knowledge of the protection afforded their dependents by their investment and savings in it, which savings are uniformly invested in the development of sound industries—thereby again serving as a public benefit. The attention of many an individual is first called to correctible conditions of ill health or physical impairment when he undergoes an examination for life insurance and his life thereby prolonged. Surely a physician who devotes a portion or all of his time to life insurance work is even more justified in considering that he renders an efficient public service which constitutes the ideal of our profession than were he to limit his activities solely to the care of the ill or to preventive medicine.

PLEURISY IN RELATION TO LIFE INSURANCE*

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My purpose in presenting this subject is to emphasize facts which you already know in regard to the significance of pleurisy, but which some of you may not always have in mind when cases with such a history appear before you as applicants for life insurance.

A thought that is uppermost in the minds of insurance companies is whether or not a history of pleurisy means a history of a tuberculous infection.

The pleural cavities are readily accessible to bacterial invasion of all sorts and while the pleura may be involved as a result of extension of infection from the lungs, it would appear that infections more frequently occur through the lymphatic drainage from the head and neck.

Pleurisies that result from infection introduced through injuries through the chest wall, or as a result of a pneumonia that happens to be located on the surface of the lung, have a different bacteriological basis from those that occur unassociated with chest injuries and pneumonias, the so-called idiopathic pleurisies. It is this type of pleurisy that is so often due to tuberculous infection and that we have come to regard as a sign of tuberculosis and for that reason great care must be exercised in the selection of lives for insurance with such a history.

The reports from the Bureau of the Census at Washington tell us of the decrease in the tuberculosis death rate throughout the registration area of the United States during the past twenty years, amounting to about 50 per cent. with an especial decrease during the past five years. That this splendid result is in large measure due to increased hospital and sanatorium facilities for the care of the tuberculous was shown clearly by Dr. Louis I. Dublin in an address before the National Tuberculosis Association, June, 1923.

According to the last report we still have, however, in round numbers, about 100,000 deaths per year from tuberculosis.

From a general economic standpoint, this disease

has always been of prime importance through the fact that young adult lives have been so largely numbered among its victims. To the life insurance companies it has always been a heavy financial burden, notwithstanding the care exercised in the selection of lives.

It requires but a hasty scanning of medical literature of the past twenty-five years or more to be convinced that we are faced with the necessity of thinking of tuberculosis whenever we think of pleurisy.

In 1905, Von Ruck, of Asheville, in writing on this subject in the *New York Medical Journal* reviewed the literature up to that time and reported statistical studies of various workers in the field of tuberculosis, from which it was concluded that an overwhelming majority of cases of so-called idiopathic pleurisy were of tuberculous origin. "Not only was this relationship conclusively shown by exact scientific diagnosis, but it stands in harmony with clinical observations in many instances in which the development of tuberculous disease has followed attacks of primary pleurisy after varying periods of time."

Von Ruck then gave the tabulated results of a later group of observers which combined numbered about 750 cases, and about 55 per cent of these afterward became definitely tuberculous.

In the examination of history records of 1,000 cases of tuberculosis, Von Ruck found a history of pleurisy in only 22 per cent. He felt that this proportion was too small for he had not infrequently demonstrated physical signs clearly indicating pleural thickening in patients who had denied any history suggestive of pleurisy.

The intimate relationship between pleurisy and tuberculosis has been shown by still another line of investigation, and I know of no more scientific and conservative report of this work than appears in the "*American Review of Tuberculosis*," 1921, by Van Zwaluwenburg and Grabfield, of the Department of Roentgenology, University Hospital, University of Michigan. Three hundred and sixty-six consecutive chest examinations formed the basis of this study, which was dependent upon the interpretation of shadows found over the apices and with greater frequency over the right apex. The results were carefully charted to indicate involvement of pleura alone, pulmonary, or a combination of the two. After discarding certain cases, the final group included only those in which three

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observers working together agreed as to the condition present.

While these cases were presented for examination in the three summer months when respiratory infections could be expected to be the least prevalent, some pathology of lung or pleura was found in about 50 per cent. The findings in the order of their frequency were: right apical pleuritis; left apical pleuritis; right pulmonary apical and left pulmonary apical involvement. By insensible gradations the shadows of pleural involvement pass into those of frank pulmonary involvement, and there is thus afforded another demonstration of the close association of apical pleuritis with pulmonary tuberculosis.

This work further points to the fact that chronologically the apical pleuritis precedes the pulmonary involvement. The infection probably reaches the pleura through the cervical lymphatic system and the prevailing tendency to spread is first to the opposite apex and then to the underlying lung tissue.

Turning now to the contribution to this subject that has been given by the life insurance companies, we find abundant testimony as to the soundness of the view that idiopathic pleurisy is, in the majority of instances, a tuberculous disease.

All of you perhaps know that a few years ago data were furnished by practically all of the large companies for a gigantic statistical study which was conducted by a committee composed of actuaries and medical directors. Among the subjects included in this investigation was the influence of a history of pleurisy on mortality of insured lives. The data contributed by the companies were based upon male lives accepted for insurance at standard rates covering a period of twenty-four years.

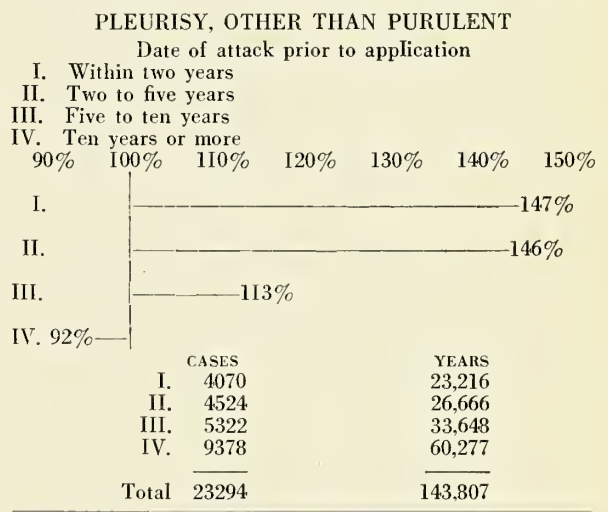
While the issues of only one month (January of odd years and July of even years) of each year was included, the abundance of data is indicated by the fact that over 23,000 lives were studied.

It is to be remembered that this was not a general population group, but a group of lives accepted for insurance after a medical examination and a review at the home office of all contributing information in support of or against the belief as to the presence of a tuberculous condition.

Mortality tables showing the expected death rate at each age among standard insured lives and covering the same period, were constructed and with those tables as a standard of comparison it was

found that lives insured with a history of pleurisy (non-purulent) within five years of date of application gave a mortality experience about 50 per cent greater than the normal or standard, which means that in a group of lives in which the normal expectation was 100 deaths per year there actually were 150 deaths.

The statistical material was divided into groups according to the period of time between the history of pleurisy and the acceptance of the lives for insurance. On this basis four groups were made on those accepted, (1) within the first two years, (2) between two and five years, (3) between five and ten years, (4) after ten years.



The above chart shows graphically that for insurance with the history of pleurisy, not more than five years removed, gave mortalities which were quite unsatisfactory. In reading the chart, the vertical line at the left may be regarded as indicating normal or standard (100%) mortality, and the departures from normal mortality by the lateral lines.

Figures are available to indicate the expected number of deaths in any group from each of the common causes, and applying that knowledge here, we find that the increased mortality is, in large measure, due to tuberculosis, for the number of deaths from that cause was three times the normal.

Furthermore, conforming to our general knowledge of tuberculosis, the mortality was relatively greater in the younger lives and also in those of under average weight.

This immensely valuable statistical study gives us reasonably firm ground on which to stand in our conclusions that the so-called idiopathic pleu-

risies are, in most instances, a manifestation of a tuberculous infection.

It is believed that the pleura acts to some degree as a barrier against the further spread of infection, but its effectiveness in this rôle is to be determined in individual cases only after a lapse of time sufficient to warrant the assumption of an arrest of the disease.

Those of us whose work does not bring us in intimate and frequent contact with tuberculosis need to be reminded from time to time of truths which we have long known, and it is with this thought in mind that I have been led to bring this subject to your attention.

The discovery and development of Insulin by Dr. F. G. Banting, Mr. C. H. Best and other co-operating investigators has brought relief to a multitude of sufferers from diabetes throughout the world. At a low price this boon has been placed within reach of all. But it is well known that only a beginning has been made in alleviation even of this one malady. Notwithstanding the magnificent advances that have been effected in arresting or averting many of the most grievous attacks of disease on human life, mankind is beset by enemies. Their strategy must be discovered and circumvented. This can be done only by patient research conducted in the main by skilled investigators who devote their lives to scientific inquiry. For these investigators the public at large must provide the means of support, for they it is who benefit immensely thereby. Such work has been going on quietly all over the world. Laboratories in the universities have groups of investigators working in co-operation under the direction of competent scientists. But only now and then does a result such as Dr. Banting achieved strike the imagination of the world. It is therefore but appropriate that advantage should be taken of it to appeal to the grateful public for support in making possible the continuance and prosecution of this work and of other investigations in medical science. To effect this and to signalize the discovery and the development of Insulin, the Banting Research Foundation has been created.

The purposes of this Foundation have been defined to be:

(a) To provide, in the first instance, further funds for the support of the Banting and Best Chair of Medical Research at the University of Toronto.

(b) To establish a fund for the adequate financial support of such scientific workers as may have proposed definite problems of medical research, and for whom funds are not otherwise available. Such assistance may be given to persons working in the University of Toronto or elsewhere.

All financial arrangements in connection with the collection and reception of the principal and subsequent expenditure of the income of the fund have been vested in a Board of Trustees, the members of which are appointed for a term of three years subject to reappointment at the end of their respective terms of office. The Trustees propose to make an appeal to the public for funds in the immediate future.

F. LORNE HUTCHISON,
Honorary Secretary.

THE VALUE OF MEDICAL EXAMINATIONS IN LIFE INSURANCE*

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On first thought, a subject such as mine may seem too elementary and almost unworthy of discussion, for, of course, most any one will say that there can be no question of the value of and the need for a medical examination before insurance can be issued to an applicant. However, I have in mind not only this value, but also the relative or the comparative value of one examination, or type of examination, as against another group or type. We who are reviewing thousands of examinations a month, from thousands of examiners, form rather definite ideas as to the kind of examination which is most valuable to us, and it is with the hope of transmitting some of these conclusions to you that this title has been chosen.

Moreover, there is a tendency, I believe, among certain life insurance executives, to question the value and the need of medical examinations in risk selection. Witness, for example, the practice of some Canadian companies who issue policies up to a certain amount without examination, also group insurance and industrial insurance. It is not very difficult to understand why an executive should have this doubt when he sees claims being paid every day on those who have been insured only a few months or a year or two, and finds such causes of death as cancer, tuberculosis, paresis, apoplexy, organic heart disease, nephritis, etc. A presumably careful examination was made only a short time before by a supposedly well qualified doctor, who reported nothing abnormal either in the history or physically. Even the medical director sometimes wonders if a careful examination was made. Very naturally both may well ask why American life insurance companies paid almost 15 million dollars to their examiners in 1922, and a great deal more last year. Of course, we know that physical signs are often obscure or even absent, that it would take a Philadelphia lawyer to question and cross question some applicants in order to get the facts, and that diagnosis, at best, is subject to many human errors. However, I am convinced that it is up to

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us of the medical profession to demonstrate, as we never have before, that medical examinations in life insurance are valuable and necessary in order to obtain a satisfactory mortality, and to justify the annual expenditure of millions of dollars for these examinations by giving as intelligent and painstaking service to life insurance companies as we do to our patients. The service rendered in securing protection against death to the deserving thousands, yes millions, who receive insurance each year at a low cost and with safety, is as commendable and praiseworthy as the service given to suffering individuals whom we see on our daily rounds. Think what eleven and a half billion dollars of insurance, issued last year, will mean to widows and orphans of the years to come! Careful examinations and intelligent medical selection are the fundamental safeguards of the insuring public, without which the most inspired financial management would be useless. The savings from the mortality factor, together with the interest earnings and a low expense ratio, represent the difference between the gross tabular premium and the net cost of the insurance. The company and the department, which I represent, feel very strongly this responsibility to give our policyholders protection at the lowest cost which is consistent with good business principles, consequently we must exclude poor risks. I am sure that the same applies to all conservative and well conducted companies. It shall be my purpose, therefore, to try to show briefly how this is done and at the same time to plead for the conscientious co-operation of the local examiners to help in this laudable effort.

Our premise, then, is this: that the determination of an applicant's insurability depends primarily upon the medical examination. In the early days of life insurance, the applicant was not examined. He simply furnished certificates of birth, of good health and of good character. With the advent of active solicitation, as the agency system grew, and with a consequent increase of the chances of selection against the company, medical examinations became more necessary and, as time went on, more exacting, to protect against impaired lives. It is a well known fact, yes, almost axiomatic, that the impaired life seeks insurance, while the healthy and normal individual must be urged to apply. The marked advance in physical diagnosis, following the middle of last century, was another factor which stimulated insurance examinations, and since

then the bond between the two has become closer and closer.

It was not until the seventies that medical selection began to build on a safer foundation by cementing an alliance with the actuarial science. Before that time, the selection of risks depended almost entirely upon the individual judgment and experience of the doctor who did the selecting, and the law of averages was scarcely considered. As the years went by, medical directors and actuaries began to work together and to formulate rules for risk selection. Some of the earliest studies in this new medico-actuarial science were undertaken by the famous actuary, Emory McClintock, when he made an investigation, in 1877, of the Northwestern's mortality experience by special groups of risks. The first count covered such classes as residence, occupations, amounts, kinds of policies, male and female risks, etc. In '79, the first truly physical impairment was investigated, namely, overweight. In the late '80's, a few classes, including family and personal histories, were suggested by Doctor Fisher as worthy of actuarial investigation. From these beginnings grew, through many intermediate steps, the later combined studies of the thirty-four companies in 1903, and the forty-three companies in 1912. In this last mortality investigation, 183 classes or groups were investigated, including occupations, medical impairments, habits, family history, build, habitat, races, etc. This is now the principal basis for risk selection, except as individual companies have counts of their own which are sufficiently large to be followed safely. Now all this statistical material, to be valuable and accurate, presupposes careful medical examinations from which the data have been gathered. The results obtained from the use of these tables in risk selection seem to indicate that the examinations were made with reasonable care. However, another factor contributed to the accuracy of the figures obtained, namely, numbers. Approximately three million policies were studied, and of course the relatively small percentage of poor examinations was probably not sufficiently great to disturb the general averages. However, if this information is valuable as it stands, how much more so would it not be, had every examination been made with proper appreciation of the need of accurate information?

This is not the time nor the place to give an exposition of risk selection as it is worked out in de-

tail, for this cannot be handled briefly, but I do wish to repeat and to emphasize the statement, again and again, that a careful examination is the primary requisite to the proper valuation of a risk.

We who, at the home office, review the reports of the examiners in the field, must have confidence in the pictures of the applicants which are sent to us. You are our eyes, ears and hands, which convey accurate impressions of the man before you, so that we may be able to place him in this or that group and decide as to his insurability. An examiner represents directly the medical department by which he was appointed and he must ever have its interest in mind rather than that of the agent or of the applicant. First and last it is the examiner's duty to report the facts as he finds them. He is being paid for furnishing a word picture of the applicant and not for his opinion as to the man's insurability. Please do not misunderstand me. We do appreciate your opinion of the interpretation of symptoms, conditions and physical findings, but the medical director is especially trained to evaluate these with respect to risk selection as determined by the law of averages. He does not think in terms of individuals but in terms of large groups under observation for a long term of years.

A life insurance medical examination blank is simply a somewhat extended history sheet, where specific questions are asked in regard to an individual's age, race, social status, residence, insurance history, occupation, weight, habits, family history and personal history. Also the blank contains a number of questions as to the physical condition as brought out by the examination of the circulatory, the respiratory, the digestive, the genito-urinary and the nervous systems. Perhaps the day will come when the blank of many questions may be discarded, and it will be possible to depend upon the informal report of the examiner, relying upon him to bring out all the salient points. But not yet have we reached this state, though each company no doubt has many examiners who could be allowed this freedom. However, it is well to remember that as a chain is only as strong as its weakest link, so an examination blank must be made to fit the weakest examiner.

From an observation of many years, I am impressed with the perfunctory way in which many examinations are made. It is apparent that we have not entirely gotten away from the early idea in life insurance that every man who applies for a

policy should get it, for his dependents need the protection. On the other hand, the primary consideration in an examination is to safeguard the interests of those who are already policyholders. To become a policyholder, the applicant must measure up to a certain standard, which differs somewhat in various companies, but the examiner has only one duty to perform and that is to give the facts in the case as they are brought out by the questions on the blank. No matter how well the doctor knows the applicant, the questions must be asked and the examination made, taking nothing for granted. Many instances could be cited where an examiner has been much embarrassed because he failed to draw out a complete history from a well known applicant. Only the other day we received an examination which gave no history of any digestive disturbance and showed nothing abnormal. Almost in the same mail came a letter from the examiner which told us that the man had been operated on for gastric ulcer two days after the examination was made. Of course the applicant withheld facts in regard to his history, but it is well to have in mind always that this is not uncommon, and that a little time and patience in asking the questions might bear fruit. Your patient comes to you and, as a rule, tells you freely and fully all his symptoms, but the applicant for insurance expects you to find out about his past symptoms and diseases by definite questions. Oftentimes the acute examiner, by minor leads, unearths important facts. Don't overlook the importance of the history. There are many diseases which constitute distinct impairments and cause either limitation or rejection. Some companies reject applicants who have had gallstones, gastric or duodenal ulcer, epilepsy, syphilis, epithelioma, tuberculosis, etc. Certain other conditions are sufficient reason to postpone for a definite period; for example, appendicitis, renal colic, pleurisy, articular rheumatism, malaria, nervous prostration, asthma, sunstroke, etc. The practices of the different companies need not worry the examiner; he will learn them in time; but it is necessary that he question the applicant sufficiently to form an opinion as to the nature of the disease, and, if there is still a doubt in his mind, to secure the diagnosis from the attending physician. In this connection, an examiner should decide in his own mind what is important and what is unimportant, but surely he should recognize the fact that if a condition is worthy of mention it is also worthy of explanation.

Much of our correspondence is caused by unexplained and incomplete or omitted answers. As a matter of general information, it is well to mention that that part of the examination which is signed by the applicant becomes a part of his contract and must be complete in every detail; further, that corrections and additions to this part, after the paper has been signed, must be attested by the applicant and not by the examiner.

In the history appear also questions as to occupation and habits. These are not primarily medical in nature, but they are just as pertinent. Many occupations are hazardous and cause rejection or limitation. Perhaps there is no one phase of medical selection which causes so much confusion as occupations, for one company accepts what another declines, and some companies rate up certain occupations which are accepted freely by others at standard rates. This will all be ironed out in time and standardized, but in the meantime the examiner can help by putting down a careful statement as to the nature of any unusual trade or occupation.

Habits in the use of alcoholics are most important. There are no questions on the blank which cause more trouble, for men are most reluctant to give the facts, especially now since we have so-called prohibition. An examiner should never assume that he knows all about a man's habits and try to answer these questions without asking them. Nor should he allow an applicant to record answers which are not in accordance with the facts as they are known to the examiner. There have been many studies of the effect of the use of alcoholics on mortality and it has been demonstrated repeatedly that total abstainers are the best risks, while the mortality rate increases in proportion to the amount of alcohol used. (Table I.) Therefore the value of the examination depends also upon the ingenuity of the examiner in eliciting the correct answers to these questions.

A proper physical examination can not be made hurriedly nor in noisy surroundings. It must be made with the same painstaking effort that you give your patient when he comes to consult you for an obscure condition. As with the history, a certain number of applicants have something to hide and they will not help you to discover the impairment. Many a man has a history of a previous rejection which he does not admit. Of course the company will know about it through the "Interchange" and I know, from experience, that it is rather embar-

rassing to be informed that a goiter or a heart murmur, or albumin, or sugar has been found more or less recently in an applicant, who was passed as first class in every way, and then discover, upon re-examination, that the impairment is still present.

Summary of the Mortality Experience of The Northwestern Mutual Life Insurance Company, with reference to use of Intoxicants. AM Select and Ultimate Table.

	Policies	Deaths	Actual	Tabular	Percent
A- Total Abstainers	132,649	4,967	10,960,600	15,745,739	69.6
B- Moderate Users	110,136	5,224	18,045,300	23,252,821	77.6
C- Regular Beer Drinkers	15,412	767	2,247,200	2,464,707	91.2
D- Regular Spirit Drinkers	3,206	289	1,601,100	1,257,773	127.3
All Classes	261,403	11,247	32,854,200	42,721,040	76.9

(Issues 1901-1908 inclusive to Anniversary in 1915.)

TABLE I

In explanation of above table, the following rules were used to govern classification:

A. Total Abstainers.

B. Moderate Users of either Malt, Vinous or Spirituous Beverages.

1. Beer or ale, not daily nor more than 3 in any one day at the most.
2. Porter or strong ale, not daily nor more than 2 in any one day at the most.
3. Light wine, not daily nor more than 4 in any one day at most.
4. Strong wine, not daily nor more than 3 in any one day at most.
5. Spirituous liquor, not daily, nor more than 2 in any one day at most.

C. Regular Beer Drinkers

1. One who uses four or more glasses of beer or ale in any one day at most, or 5 or more in a week, or a daily practice of 1 or more. Include where wine or whisky is also used moderately but not enough for Class "D."
2. No "wine only" cases in this class.
3. Two glasses of beer and wine a day.
4. Beer and wine at meals, moderately.
5. Porter or strong ale daily, or 3 or more in any one day at most.

D. Regular Spirit Drinkers

1. One who uses all kinds but not entitled to Class "B."
2. Wine daily, 5 light, 4 strong, or more.
3. Spirituous liquors daily, one or two drinks a day, or 3 or more in any one day at most.
4. Two glasses of beer or wine or whisky a day.

The Company has never knowingly accepted men who might be termed free users of either beer, wine or whisky, nor those who use alcohol to the extent of intoxication at times.

It was missed only through carelessness, but that is no excuse. An examiner must be ever on guard against the dishonest applicant. Fortunately there are not many such, but still it is strange how a man may justify himself in putting something over on an insurance company when in all other business deals he may be most scrupulous. Again the idea is prevalent that it is up to the doctor and to the company to find out, and, if he can get by, he holds himself blameless. Has an applicant been coached or specially prepared for the examination? It is well to think of this possibility. For example, is it not possible for a diabetic to pass a satisfactory examination, if he withholds the history and is under treatment with insulin or on a modified diet? The careful examiner would undoubtedly note the marks of the hypodermic needle or have his attention called to the subterfuge in some other way. Let me cite an example of a rather remarkable instance of careful observation. Two or three months ago, one of our examiners reported upon a man that he could not find anything definitely wrong with the circulatory system, but still there was a doubt in his mind as to the condition of the myocardium. He asked that we get the opinion of another doctor. The second examiner also reported that the heart sounds were normal, except for some disturbance of rate and rhythm; the blood pressure was normal, and so was the urine. We declined the risk. A few days ago we were informed that this man died suddenly. This is the kind of opinion and co-operation which is valuable.

No paper by one of Doctor Fisher's assistants would be complete without some words about blood pressure. We all know of many men and women who have lived for years with a high blood pressure, but we have demonstrated that on the average, large groups of men with a persistently high arterial tension show a mortality higher than normal. (Table II.)

Perhaps I have said some things which might be construed as a criticism of our profession. If such it is, I hope that it may be thought constructive and of some value. I believe in the medical profession, and I further believe that there is no other profession or class of men which, as a whole, ranks higher in honor and integrity or in the service given. In the early history of life insurance, many companies would not permit a family physician, even though he were an appointed examiner, to examine his pa-

TABLE II.

Summary of the Mortality Experience of The Northwestern Mutual Life Insurance Company, with respect to the Palpatory Systolic and Auscultatory Diastolic Blood Pressure									
Year of Entry	Average Systolic Pressure	Average Diastolic Pressure	Number of Cases Accepted	Number of Cases Rejected	Average Age at Death	Ratio Annual to Expected Mortality (Cannons No. 7 table)			
						100 %	150 %	200 %	%
1913-1920	Low Blood Pressure (90 mm. and under)	10.00	3380	28	35				100.0
1921-1922	Dependent Blood Pressure (90 mm. and under)	10.00	1347	71	33				79.0
1923-1924	Dependent Blood Pressure (90 mm. and under)	10.00	40-60	2070	310				84.0
1925-1926	Dependent Blood Pressure (90 mm. and under)	10.00	40-60	230	90				114.0
Risk Rejected for High Blood Pressure Only from 1927-1928-Mortality Compared to Cannons No. 7 table	Low Blood Pressure (90 mm. and under)	10.00	743	19	35				100.0
	Dependent Blood Pressure (90 mm. and under)	10.00	711	34	33				120.0
	Dependent Blood Pressure (90 mm. and under)	10.00	1190	181	33				124.0
	Dependent Blood Pressure (90 mm. and under)	10.00	1465	274	33				150.0
	Total	10.00	4163	307	33				120.0
	High Blood Pressure (90 mm. and over)	10.00	325	35	35				100.0
	High Blood Pressure (90 mm. and over)	10.00	1085	125	33				120.0
	High Blood Pressure (90 mm. and over)	10.00	998	131	33				120.0
	High Blood Pressure (90 mm. and over)	10.00	627	121	33				120.0
	Total	10.00	309	134	33				120.0
*The Northwestern Mutual Life Insurance Company's General Mortality Experience about 80% of the Table									
†Expected Mortality									

TABLE II

Table II gives a summary of the Northwestern's Blood Pressure Studies. The palpatory systolic pressure has been used uniformly throughout because this was the way we began. The groups referred to in the first four lines are accepted risks. All the others are rejected risks. We were able to follow these latter cases,

- 1st, by previous policies in this company,
- 2d, by information from other companies,
- 3d, by correspondence with examiners and agents.

In this way we learned when death occurred and in most cases the causes of death.

No cases are included where the blood pressure later became normal.

In none of these cases was any other impairment found; the rejection was based wholly on hypertension.

Of the 507 deaths, 363 were due to cardio-vascular and renal diseases, or a little over 71 per cent.

It is apparent, from this study, that a persistently high systolic arterial tension results in an excessive mortality, and the higher the pressure the greater the death rate.

tient for life insurance, for fear of prejudice in favor of the patient. It seemed to Doctor Fisher that this reasoning was wrong, for the family physician, provided he was honest, was in a better position to furnish the company with reliable information concerning the applicant's past and present health record than any one else. So such examinations were encouraged. About thirty years ago, we began to keep a record of all approved examinations made by a regularly appointed examiner of the company, who was also the applicant's family physician. A few years ago, 38,550 such cases had been accumulated and the mortality of the class was 12 points better than the general average mortality of the company for the same period. "This certainly speaks well for the integrity of the man whose duty lies in one direction and his sympathies in another."

In conclusion:

1. A life insurance examination is a serious undertaking, upon which depend a satisfactory risk selection and a favorable mortality.

2. Its value to the company you serve rests upon the facts which you are able to elicit by careful history taking and through physical examination.

3. Let us all, both examiners and home office representatives, bear in mind that when a poor risk is given insurance and becomes an early claim, it is the policyholders who pay the loss, for they constitute the company. On the other hand, when we are diligent in our efforts to exclude such risks, we render a distinct service to the large numbers who depend upon us for the protection of their families at the lowest possible cost. Our consideration must always be the greatest good for the greatest number.

WOULD-BE SYLPHS MUST QUIT EXTRAS

Eating little at meal times and much in between is the poor system which most persons employ to cut down their weight. Then they wonder why the scales are discouraging to any honest effort to reduce.

Some pitfalls in the path of those who have joined "the cult of sylphs" are given by Dr. L. M. Davidoff, Boston physician, in a humorous but helpful article entitled "Now This Matter of Reducing Weight!" which is featured in the April issue of *HYGEIA*, popular health journal.

Tidbits and "extras" cause the downfall of most of those who are following the national craze for reducing, says the article.

The average woman needs a diet of between 2,300 and 2,800 calories per day; a healthy man's diet should consist of between 2,800 and 3,000 calories daily. To reduce weight appreciably it is necessary to cut down to 1,600 calories.

"But suppose," says Dr. Davidoff, "that a woman has reduced her food intake to 1,600 calories at meal times, let us consider what her extra tidbits amount to."

One pound of chocolates even though it is made to last over four days will be equal to about 800 calories a day.

Tea with sugar and without cream adds another 40 calories.

One cup cake with the tea raises the total by 150 calories.

Tasting the dinner, eating the extra frosting, "not wasting" the whipped cream, etc., adds 200 calories more.

Then it is a shame to throw away perfectly good food that is left over from meals! Think of the poor orphans across the water who haven't even bread enough! So instead of the garbage pail, 300 or 400 calories more.

The "apple a day" is eaten religiously with a resulting addition of 50 calories.

If it is theater night, or bridge night, or sewing circle night, two or three delicate cheese sandwiches with hot chocolate and whipped cream—500 calories.

FUNDAMENTAL PRINCIPLES AND RECENT CONCLUSIONS IN SURGERY OF CONGENITAL CLEFT PALATE*

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While attending the Pennsylvania College of Dental Surgery of Philadelphia I also had the privilege of attending the surgical clinics of Dr. James E. Garretson, the father of oral surgery and the foremost man of his time in this special field of work. It was my further opportunity and pleasure to attend regularly the clinics of Dr. S. D. Gross, the father of American surgery, of Dr. Joseph Pancoast, one of the foremost surgeons of his time, of Dr. J. Ewing Mears and of Dr. D. Hayes Agnew, whose name was broadcast throughout the world by reason of his services to our martyred president, James A. Garfield.

After graduation fifty-one years ago I concluded that, inasmuch as I had never before been as far east as the boundary between Illinois and Indiana, I would visit the surgical clinics of Washington, Baltimore, New York and Boston, presuming that I would never again have an opportunity to travel so far east.

In New York I visited the clinics of various surgeons of renown, among whom was the leading orthopedic surgeon of the day, Dr. Louis Sayre. I presume many of you know that he was congenitally lame. Probably through his misfortune he was led into surgery, and orthopedics especially appealed to him.

It was in Dr. Sayre's clinic that I was prompted to undertake a kind of work which he declared was impossible. To this clinic, which was large, patients came who suffered from all sorts of deformities, congenital and acquired. On my first visit, there was among them a tall, thin, poorly clad woman, bearing all the evidences of extreme poverty. In coming, she had faced a snow and rain storm, so common in the last days of March. Her face wore an anxious, troubled look. She had brought her little child, two weeks old, to the great surgeon with the hope that it might be cured.

Its deformity was one of the most conspicuous and distressing that ever saddens a home. It consisted in protruding premaxillæ, double cleft lip

*Read by invitation before Minneapolis Surgical Society, Dec. 6, 1923.

and complete cleft of the palate, the vomer not being attached to either side.

The surgeon took the child in his hands and explained to the class the nature of the deformity. He said in substance, "Gentlemen: This child's deformity is so extensive, the tissues are so abnormally placed, that it is not amenable to successful treatment—the treatment that would bring all the parts into normal relation. You will observe that the premaxillary bones are more prominent than the nose: the prolabium is far removed from the lateral portions of the lip. We have one course open to us and that is to excise the bones, after which the clefts in the lip may be closed." He held the child up before the class and said, "I grasp with my hand the sides of the child's face and find that I am able to move the bones toward each other. If we had some way by which these bones might be approximated, the premaxillary bones brought into correct relation with the maxillæ and if we could, after placing them in contact, immobilize them and bring about a union, we could go far toward correcting the deformity. But such an operation has never been performed. We have no means of doing it."

The doctor handed the little child back to its weeping mother, who stood holding it fondly in her arms, still looking at him while he informed the class that some months later he would excise the premaxillæ and sew up the lip and when the child was nearly grown an artificial palate could be provided as an aid to speech.

The incident was tragic. The expression of the mother's face I can never forget. She turned away with a saddened heart, to wander through the beating storm with a feeling that there was scarcely any hope for her unfortunate child. A deep impression was made upon the class. Not a sound was heard among the students while the child's condition was being described by the surgeon. Everyone, it seemed to me, was in deep sympathy with the mother. Such was the experience of this mother—and even today oftentimes little hope of help is offered to the mother, who is always the greatest sufferer.

I repeat Professor Sayre's statement: "I grasp the sides of the child's face with my hand and find that I can move the maxillary bones toward each other. If we had some way by which these bones might be approximated, the premaxillary bones brought into correct contact with the maxillæ and

if we could, after placing the bones in contact, immobilize them and bring about a union, we could go far toward correcting the most conspicuous deformity known to mankind. But such an operation has never been performed. We have no way of doing it." The pale-faced, disappointed mother is still before me; the stentorian voice of the late premier American orthopedic surgeon still rings in my ears as he said: "Such an operation has never been performed. We have no way of doing it."

It was then I was obsessed with a desire which has been never-failing but increasing to devise a way that would enable me to bring about a union of the separated, misplaced bones in such deformities. More than the average human lifetime has been devoted to devising and improving a method which will give as a result a hard palate of normal breadth, a long, flexible, well-formed soft palate and an arch or framework upon which to construct a full, well-shaped lip and normal nose. Upon my return home in the spring of 1872, I began to work conducting experiments upon the bones of young animals. Professor Garretson had told us that because of the fact that the bone was not sufficiently ossified to fracture, he could take the tibia of a kitten and tie it in a knot. It is estimated that at birth, bone is about one-half organic matter and therefore capable of bending or moving when pressure is made upon it. So I believed that the maxillary bones in a young cleft palate patient might be bent and moved into proximity.

I found that at that time in New York City and quite generally through the country, many of the leading surgeons had abandoned palato-plastic surgery on the ground that their operations were generally failures. Garretson has said: "As generally practiced, it is rather difficult of performance and so frequently unsuccessful that the surgeons seem disposed to avoid the responsibility of it." Non-union occurred in a large majority of their operations and failure of function nearly always followed. Had they understood the proper age at which to perform these operations, the order of procedure of the different steps and especially the correct technic of the bone surgery essential to this work, they would have operated on these patients in infancy with good results.

From 1860 to 1880 and later, the great prosthetist, Norman W. Kingsley of New York, with numerous assistants, was occupied with construction

of artificial vela for cleft palate patients, many of whom had undergone unsuccessful operations.

In the light of surgical advancement and the development of modern methods of procedure, the old time theory that infants could not endure palate operations and that they should be made only on children from seven to ten years of age or thereabouts, has become a thing of the past. We now know that every advantage is gained by early operation which allows the proper order of procedure; less shock and reaction, greater ease of manipulation and results in correct function. To delay operating until after habits of speech have been developed, which are frequently so defective that the individual cannot be understood, is oftentimes an irreparable mistake.

All surgery of the palate should have for its goal perfect function, that is, perfect speech. The test of success is the quality of enunciation resulting. Two phases of palatal surgery have especially to do with this: first, the union of the separated bones of the palate including the management of the premaxillæ and, second, the control of the tuberosities in their relation to the soft palate. These two fundamentals I wish to emphasize, for without a proper conception and execution of these in palatal surgery there is small hope of securing satisfactory results either in form or function.

I wish to present to you briefly the course which I am convinced leads to the nearest approach to normal form and function in the palate. This course provides for operation in early infancy, it contemplates the establishment of a *normal palatal arch* and the *prevention* of the *spreading* of the *tuberosities*, it calls for *three stages* in the treatment of typical double cleft of the lip and palate and *sometimes four*, if complicated by protruding premaxillæ. These stages are as follows: (1) the freshening, approximation and immobilization of the cleft bones so that union may take place; (2) the closure of the lip; (3) the closure of the soft palate; (4) elevating the nose, which may have become flattened by moving the premaxillæ backward.

1. This step should be done as soon after birth as is expedient. I have found the fourth to tenth week most satisfactory, as in an otherwise normal child all functions of the body have become fairly well established by that time.

2. The closing of the lip should be done in

from six to ten weeks after the bones have been approximated.

3. The closing of the soft palate should be deferred until just before speech is attempted, that is, not earlier than the eighteenth month.

4. The nose should, if necessary, be elevated later.

While agreement is fairly general now as to the wisdom of the early operation, uniform procedure is not so general. It is still all too common to find surgeons closing the lip first, depending upon the traction of the orbicularis oris muscle to accomplish the desired effect upon the bones; or passing a single wire through the anterior part of the separated maxillæ, thus bringing them together. The closing of the lip and the resultant traction of the orbicularis oris muscle *will* gradually move the anterior part of the cleft bones into contact, but the bones will not, as a rule, be normally approximated or united. The bone carrying the premaxilla protrudes beyond the maxilla of the opposite side, leaving an ugly malformation of the nose and arch. Besides, there cannot be union of the bones with the muco-periosteum intervening. They may not even meet, they remain malposed and leave the patient deformed throughout life.

A wire suture passed through the anterior part of the cleft bones will often cut out. It is more than likely to do so unless an incision is made over the line of union between the maxilla and premaxilla of the side opposite the cleft, the anterior half of the bone separated, the protruding premaxilla crowded downward, either bending or fracturing the lingual surfaces of the bone, so that an approximation of the cleft in the alveolar processes may be made.

MANAGEMENT OF PREMAXILLAE (Fig. 1)

A review of the literature convinces me that protruding premaxillæ have never received the careful attention which has marked the investigations of surgeons in treating other physical defects. Some authors advise excising the bones; others advocate closing the lip over them when possible; still others advise removing a V-shaped piece from the vomer, moving the bones back and closing the lip over them. We often find the vomer divided, the premaxillæ moved backward, the cleft lip closed and no effort made to freshen, approximate and stabilize the bones.

Protruding premaxillae, separated as they are

from the maxillæ, should be considered as a recent fracture and so treated. *Under no circumstances should the premaxillæ*, even though they amount to only a small tubercle on the tip of the nose, be



Fig. 1. Profile of patient with protruding premaxillæ.

removed. These bones, together with the teeth which they embrace, have an important function. They add symmetry and beauty and impart normal contour to the face. Their loss means prognathism with its unsightly deformity. The upper lip recedes and the nose becomes broad and flattened. The superior arch becomes contracted so that the upper teeth occlude on the lingual surfaces of the lower. The loss of these bones is always unnecessary, unsurgical and should be deplored. Neither should they be excised nor simply forced back (Fig. 2). Would a surgeon feel that his duty was well done in the treatment of a compound fracture of the femur if he crowded the fragments into place without removing the intervening tissue and then closed the external wound? Would he expect to secure bony union without the application of splints and without immobilizing the parts? Similarly, a nor-

mal maxillary arch can be secured only by treating the parts in the same manner as one would handle a fracture, i.e., remove intervening soft tissues and approximate the bony fragments.

The premaxillæ should therefore be moved into place after freshening the surfaces which are to come into contact. The compact bone should be removed and the freshened surfaces of cancellated bone placed in contact and immobilized. When this is done, the soft tissues covering the bones may be sutured with horsehair. To divide the vomer, move the premaxillæ back and make no attempt to unite them to the maxillæ, is unsurgical, cannot produce a normal arch and may be likened to the treatment of a fracture elsewhere without assuring bony contact and immobilization with resulting non-union. The wires should not be passed through the premaxillæ but anterior to them and beneath the soft parts.



Fig. 2. Result following the excision of the premaxillæ. Note contraction of upper lip and protrusion of the lower. (Author's case.)

An attempt to move the premaxillæ backward should not be made in a patient younger than three months, because the bones have not become sufficiently ossified to form well defined alveoli. Besides, the lateral surfaces of the teeth are often covered by the soft parts only. Obviously, the teeth at this early age may be easily displaced.

ADJUSTING WIRE SUTURES

Introducing the wires is not difficult for the surgeon who knows the technic. Passing the wires through the maxillary bones in the usual way anteriorly and posteriorly and adjusting the lead plates enables the operator to approximate the alveolar processes and at least one-third of the palatal plates of the maxillæ, moving and holding the tuberosities in normal position, so that when the soft palate is united it will be of normal length and flexibility.

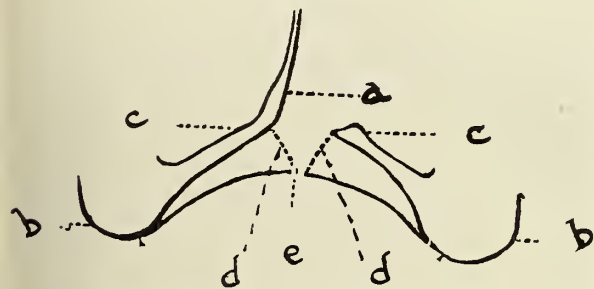


Fig. 3. Illustration showing the position of the horizontal plates of the maxillæ and the vomer, as they usually appear in single cleft lip and cleft palate. b—b, alveolar processes; c—c, horizontal plates; a, vomer; e, separation of the hard palate as it would be if the horizontal plates were lowered; d—d, lines of descending arch.

When the posterior two-thirds of the maxillary plates are elevated at an angle of 45 to 75 degrees, their borders do not meet (Fig. 3). The abnormal elevation of the posterior two-thirds of the horizontal processes of the maxillary bones is lowered by means of the wires and lead plates (Fig. 4).

Criticisms have been offered by men inexperienced in using lead plates or without the opportunity to observe their proper use, that they are likely to produce necrosis of the bone. I have never had nor have I ever seen a case of necrosis of bone follow the correct use of lead plates. If it occurs it is due to defective technic. Recently a patient returned to me who had worn these plates for two years, without the slightest inconvenience and without injury to the parts.

SPREADING OF THE TUBEROSITIES

I have spoken of the closing of the lip first as one means of approximating the separated bones.

The lip operation is one of the oldest in the annals of surgery, being described by Celsus, who was a contemporary of Tiberius (42 B. C. to 37 A. D.).

When the anterior part of the cleft is brought together either by the lip traction plan or by the single wire, the surgeon fails to give consideration to the consequent separation of the bones posteriorly. Every surgeon experienced in this work realizes that oftentimes these bones are widely separated posteriorly, due to the moving together of the anterior part of the cleft and action of the muscles and they cannot assume a normal position unless measures are employed to overcome this separation. The maxillæ act as levers, the malar processes becoming the fulcrums, and as the anterior ends of the maxillæ are drawn together the posterior ends move apart (Fig. 5).

Unless steps are taken in early infancy to prevent the tuberosities from spreading (as by the use of wires not only anteriorly but posteriorly) the bones will widely separate and the palate will be shortened to such an extent that perfect speech will seldom be secured. When the tuberosities are abnormally separated the soft palate, when united, will be put on the stretch and consequently shortened so that it cannot reach the post-pharyngeal wall; it will be like a drumhead without flexibility or resilience. If lateral incisions are made through the soft palate in an attempt to relieve the tension a great mass of cicatricial tissue will result, making

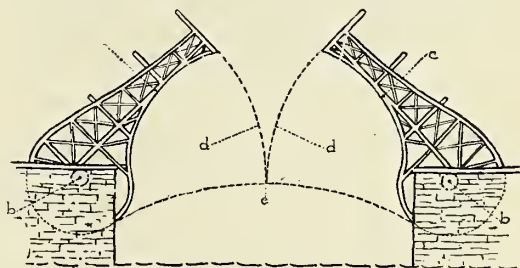


Fig. 4. Following the lettering of Fig. 3 as far as possible, for we have no a, to represent the vomer, b—b are the pinions of the bridge which correspond to b—b, the alveolar processes in Fig 3; c—c, correspond to the horizontal plates of the palate bones, misplaced upwards; d—d, lines of the descending arch which terminate in the meeting of the hemispheres of the bridge at e.

it thick, unwieldy and inflexible. It must be remembered that lateral incisions oftentimes divide the fibers of the tensor palati muscle, which has a two-fold function—that of making tension on the palate and dilating the pharyngeal orifice of the Eustachian tube during the act of swallowing. The result of the division of this muscle may thus lead

to early defective hearing, due to destruction of the continuity of the muscle and consequent failure of the normal dilation of the pharyngeal orifice of the Eustachian tube. When operating on the soft

length may be produced. (Figs. 6 and 7 contrast the two arches.)

IMPORTANT POINTS TO BE OBSERVED IN CLOSING PALATAL CLEFTS

My observation has been that function often has not been considered as an object to be attained. It seems that operators too frequently aim to close the cleft without achieving the all-important anatomical functional result. As I have said, function is dependent more on preventing the tuberosities from spreading than any other factor. When they *are* spread in young infants they must be narrowed to their normal breadth.

Moving the bones together in the anterior part of the cleft without attempting to prevent the tuberosities, which are oftentimes already abnormally separated, from further spreading contributes to the making of a short palate followed by defective

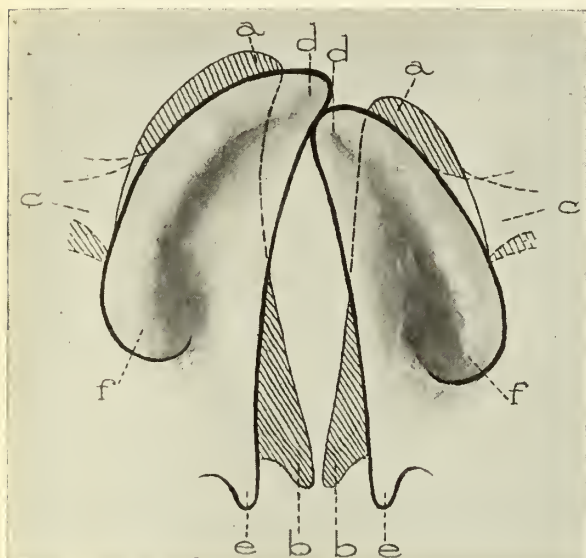


Fig. 5. Drawing showing change in position of the palate and alveolar processes due to either contraction of the orbicularis oris muscle after the lip operation or the result of moving the anterior alveolar processes together.

- a—a. Bones widely separated at birth.
- b—b. Posterior part of cleft at birth.
- d—d. Anterior part of cleft after alveolar processes are moved together but not united.
- e—e. Posterior part of cleft has widened. As the anterior part moves together the posterior part separates.
- c—c. The malar processes, the pivots upon which the leverage is exerted to move the posterior parts outward while the anterior parts are moved inward.
- f—f. The tuberosities widely separated as the result of failure to move them together or to prevent them from separating.

palate, the posterior wire should be passed as nearly as possible through the center of the tensor palati muscle as it swings around the hamular process, thus suspending the contraction of the muscle until the hemispheres of the palate unite.

I regret that I have not time to discuss the plastic surgery of the lip, the management of the defective nostril and the operation upon the nose, operations so important in rounding out the work of making normal these patients who are the victims of such distressing conditions. But what does it avail, to produce the most careful and painstaking operation on the lip, if underneath there is an improper foundation for this superstructure? There must first be provided a normal, well-rounded arch upon which to build a well-shaped lip and there must be a normal position of the tuberosities in order that a flexible, resilient soft palate of sufficient

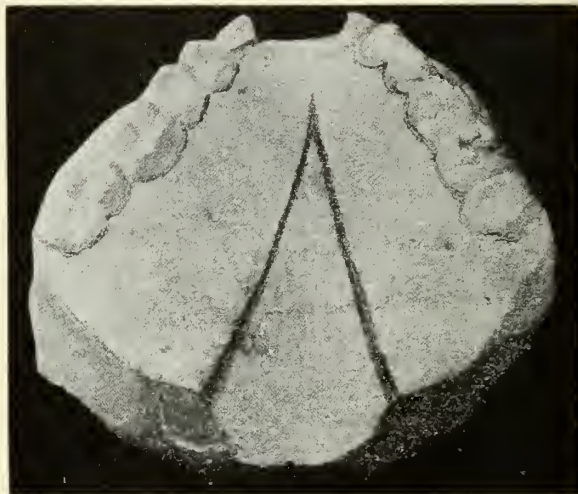


Fig. 6. Cast showing the premaxillae removed, and extremely broad cleft of the palate. The distance between the buccal surfaces of the third molars is $3\frac{3}{4}$ inches. (Author's case.)

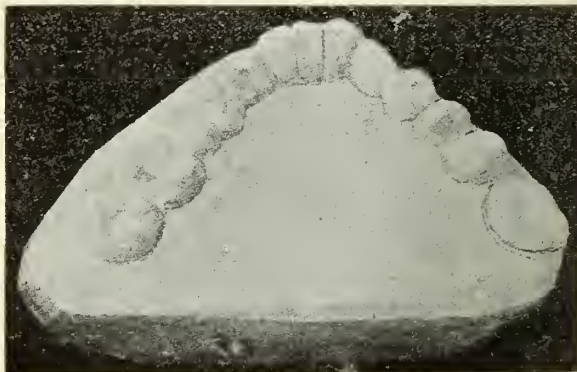


Fig. 7. Lower arch equally broad. Compare with preceding figure.

speech. Spreading of the tuberosities makes the palate too short and a palate too short makes the function of speech defective. The surgeon who permits the tuberosities of the maxillæ to spread,

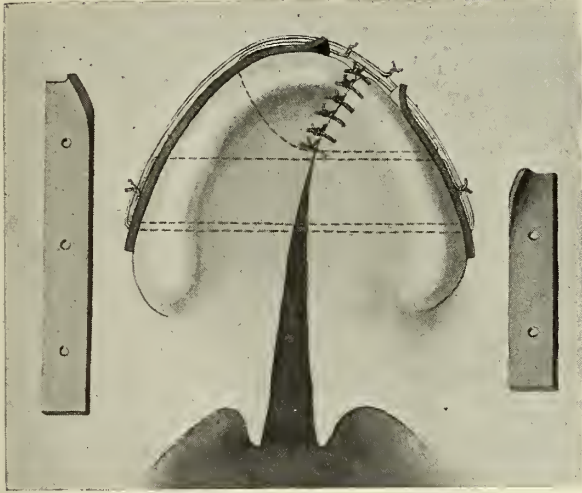


Fig. 8. All wires and plates in position, maintaining the parts in quiet contact until union is accomplished. Lead plates, No. 13 American gauge, shown at sides, perforated for the passage of the wires.

thus making it impossible to secure a long palate, will meet with failure in his results and usually correct speech will be made impossible. In such cases, to make a palate that will reach the post-pharyngeal wall, a section of each of the palatopharyngeal muscles may be added to it.

When the bones are separated at birth, there is only one logical course to pursue, that is to freshen the surfaces that should be united as would be done with fracture of any other bone and approximate and immobilize the fragments. All general surgeons *do* so treat fractured bones. The *separated* bones of the palate should receive like treatment (Fig. 8).

To fail to unite the bones in early infancy usually leaves a deformity throughout life. A long, flexible soft palate, correctly functioning, is largely dependent upon a normal bony arch.

The surgeon, after operating on a soft palate in a youth or adult, finds the united palate tense and short. He reasons it is due to atrophy prior to the operation. It may be due in part to atrophy, but in a large majority of such cases spreading of the bones is an important factor in making the palate short, tense and drumhead-like.

The mattress suture is often valuable in the muscular tissues, but the interrupted suture is more

desirable in the muco-periosteum with an occasional mattress (end to end) suture.

Tension of the palate is relieved to a great extent by lowering it as far laterally as the hamular process instead of making incisions in muscular tissue (Fig. 9). Failure of union of the soft parts is often due to failure to properly denude the bones of the muco-periosteum and to improper suturing. An operator sometimes fails by making his sutures too tight. He must bear in mind that the tissues will not stand pressure and stretching; there must be relaxation sufficient to insure good circulation. Failure of union of the soft parts is sometimes due to the cutting out of sutures. The proper use of silver wires and lead plates will avoid this.

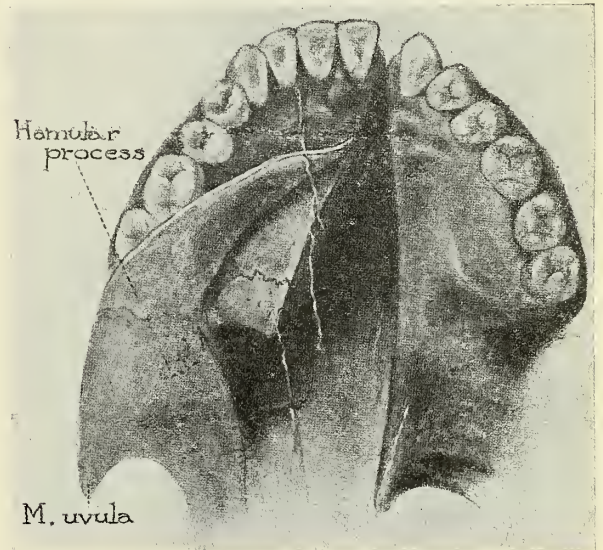


Fig. 9. The muco-periosteum is denuded from the bones of the palate as far back as the hamular process of the sphenoid bone. The flaps are then approximated and united.

The lead plates (Fig. 10) are not intended to be used for stretching the palate and pulling the edges together, but are to be used when the wires are inserted and the palate sutured—when the plates are put gently in contact with the mucous membrane and the wires twisted, but without tension. The plates are to prevent the sutures from cutting out and to hold the edges of the cleft steadily together. They also act as splints, so that when the palate moves it moves *en masse*. Dr. Hayes Agnew cut the tensor palati muscles to relieve tension. The wires and plates relieve tension without destroying the function of the muscles.

Extending over a period of forty years, we have read from time to time of devices—plates, et cetera—used to prevent the tongue from interfering with the newly approximated surfaces of the palate.

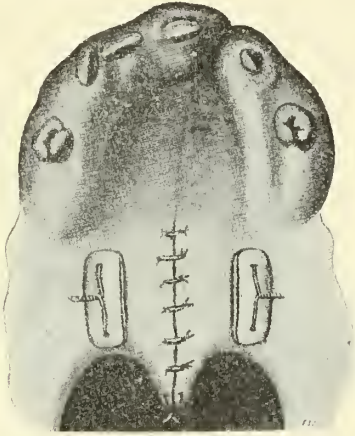


Fig. 10. Lead plates in position. They must be free from sharp corners and edges, and the wires not too tight lest the tissues be cut.

Their use, however, has been transient. The wires with which the lead plates are fixed are bent down in such a way that they do not lacerate the tongue but make contact of the tongue with them uncomfortable, thus avoiding disturbance of the palate.

It is the duty of the surgeon to see that the plates are properly adjusted. If they are not properly adjusted, if they are made too tight, if they are so placed that they will cut the tissues, failure is likely to follow.

The palate demands thorough cleanliness. Only by daily observation on the part of the surgeon and cleanliness on the part of the nurse, may the highest degree of success in treating cleft palate be achieved.

CONCLUSIONS

There are no operations in the whole broad field of surgery in which so large a percentage of failures occur as in palatal surgery. It must be remembered that the most careful operator, who has performed a perfect operation, may fail to secure a good result because of specific disease. Moreover, sometimes a most promising case coupled with the greatest care and perfect technic may result in failure on account of conditions beyond the surgeon's control.

The greatest obstacle in the way of success in maxillo-palatal surgery is a lack of knowledge of the correct age for the different steps and the methods of procedure. So long as the majority of

medical colleges utterly fail to teach their students this subject just so long will the principles underlying the surgery of the palate be misunderstood and, as in the past, there will continue to be innumerable failures in operations.

Those who operate on cleft palate only occasionally and the uninformed do not realize that maxillo-labio-palatal surgery is a vast field for study and practice. When we see mutilations, such as amputation of the premaxillæ, et cetera, which cannot be too strongly condemned, when we see that many without a knowledge of the fundamentals of the subject are continuing these practices, we feel that all measures available should be employed to stimulate the study of oral surgery and thus avert such calamities.

It must appeal to every surgeon, who logically looks upon the situation, that articles which have appeared in certain text books in the United States, England, France, Spain and some other countries, repeating the writings of authors of hundreds of years ago on the treatment of cleft palate, are antiquated and do not set forth the truths that have been revealed up to this period.

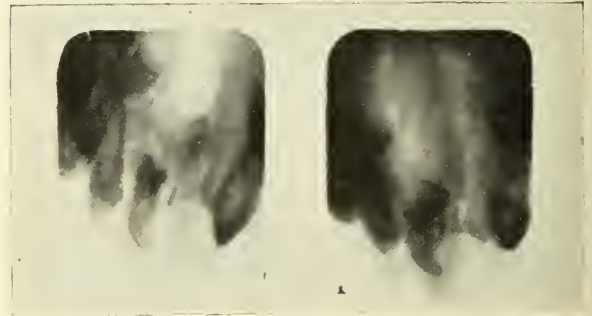


Fig. 11. Upper centrals.

The author of a text book assumes a great and solemn responsibility. Every child who is operated on by a surgeon whose knowledge in treating these cases was acquired by *reading* a text book with such teachings as the excision of the premaxillæ and consequent permanent mutilation of the patient, may well place the responsibility of this procedure at the door of the author.

DISCUSSION

DR. CARL W. WALDRON: It has certainly been a great privilege to be here tonight and hear Dr. Brophy give his experience during what is more than the span of lifetime of most of us here, an experience that has been fraught with many disappointments in some ways but yet always increasing and attaining more perfection.

Those of us who have made a study of Dr. Brophy's textbook will realize that tonight he has given us some ideas that are not incorporated in his textbook, particularly with reference to the time of the bone operation. I think eight or ten years ago Dr. Brophy was far more anxious to operate within the first week of life of the tiny infant than he is today. He has learned from experience that there is developed with the alveolar process greater protection of the developing teeth by waiting for a certain period of time, but not waiting too long; not waiting until the time when the process of molding, digital molding of the bones is made difficult by ossification.

This is one detail we might discuss for a minute—this matter of molding. Some of the observers, particularly Thompson, of Galveston, lay particular stress on this feature: during the operative procedure on the alveolar process, time should be taken; not too much hurry to insert wires, for instance. Take plenty of time to do what he calls digital molding, using plenty of firm, re-applied force to approximate the separated bony processes, and then hold them with the wires rather than to use the wires as a means of drawing them together. I think this is an important point. I feel that it has been so in my own practice. In taking care of these patients I take plenty of time to bring the parts together as well as possible with firm pressure of the thumbs. I might state that in my own experience the very process sometimes tires me out. My hands will ache for some time afterwards; it is somewhat difficult.

Dr. Brophy's emphasis of the importance of bony contact and immobilization is well taken. I feel that it is an important part of the operative procedure. There is one thing that might be mentioned and that is that I feel most anatomists agree that the smaller fragment in a unilateral cleft is in a relatively normal position as far as its lateral position is concerned, the displacement being an upward one of the palatal process. So in molding we must pay particular attention to the larger fragment to bring it over and approximate it to the smaller fragment and then hold it with the wiring.

I would like to ask Dr. Brophy one question with reference to bony union. Those of you who have read some of Dr. Ritchie's articles on this subject—and we are sorry that he is not here tonight because we would like to have him present his ideas on the question of preliminary lip closure—Dr. Ritchie says he has yet to see evidence of bony union as shown by the *x*-ray. I would like to ask Dr. Brophy if he has made any systematic record post-operatively, that is, three or four years after operation, of the presence of bony union by the use of dental films and careful *x*-ray studies.

There is another thing: this question of the single wire. I think if we are looking upon our wires as a means of approximation that the single wiring without the use of plates should be condemned; whereas if we carry out, as I described previously, the careful molding, in many cases a single wire if placed sufficiently posteriorly from the anterior cleft will suffice. I am sure that many men are getting excellent results by such a method. This problem of the spreading of the tuberosities also hinges upon the question of the placement of the wire and somewhat on the preliminary molding. I feel that it will not take place if

the molding has been done very carefully and the wires are put in carefully.

Now we have the problem of the soft palate—Dr. Brophy feels that the lead plates are essential in so far as the control of tension is concerned. I think Dr. Ritchie has added to our knowledge in the handling of the muscle problem in the lip and palate operations by his careful denudation, not by cutting away muscle but by a wide exposure of muscle fibers and the use of muscle sutures. I believe that to date he has had no muscle separation and no separation of the soft palate following operation. He has not to my knowledge resorted to the use of plates.

There is one important point in connection with the closure of the hard palate and that is that measurements should be taken. We should estimate for instance the distance from the alveolar process to the alveolar process just anterior to the position of the tuberosity, and then measure again the widths from that point to the margin of the cleft and determine whether there is sufficient tissue. If it is not there, wait for it to grow. We must figure that it is better in these cases to wait a year and if necessary make more extensive use of all our aids in the training of speech, and at the same time be sure of a closure; rather than to operate before for instance the fifteenth or sixteenth month of age and take a chance on the closure. It is much better, I feel, to wait for another year perhaps until we know by our measurements—say the measurements of a plaster cast that we can make from an impression—that we have sufficient tissue and can at least expect a closure at perhaps two operations, if not successful at the first attempt.

The question of the operative closure of the recurrent perforations was not taken up by Dr. Brophy. I feel that the delayed flap, which is a modification of the flaps we used a great deal in war surgery, is an advance in the hazardous undertaking of closing some of these recurrent perforations where the blood supply is not as perfect as we might hope.

I would like to ask Dr. Brophy where the special nipples may be obtained for use in feeding these posterior cleft cases, while waiting a year or two for the time for the operative closure to be performed.

In closing I want to again thank Dr. Brophy for the treat he has given us tonight and to assure him that when I go to Chicago I shall always call on him to see the good work he is doing.

DR. R. E. FARR: I would hardly have the temerity to discuss this subject in the presence of Dr. Brophy excepting that I wish to add a word regarding my esteem for Dr. Brophy and the work he has done. My notion for many years has been that cleft palate surgery began with Brophy and ended with Brophy. My feeling is that twenty or perhaps fifty years from now the work that Dr. Brophy has done will be much more appreciated than it is at the present time.

My experience is limited and yet a large percentage of the cases that have come to me have been operated upon by methods which Dr. Brophy does not and never has advocated. Generally these patients have been operated upon by the preliminary closure of the lip. Several years ago I showed four pictures of children from eight to twenty years of age with the forefinger of each lying in the cleft between

the bones, and these children had all had the lip closed within the first three months.

The whole question before us is: shall we repose the bone or not? This picture tells the story. Here is a photograph of a little baby before the wiring. A line down the center of the face cuts the ala on the side of the cleft about at the midpoint, that is, three-quarters of the way between one ala and the other. There is three-quarters of the nose on one side and one-quarter on the other. After the wiring, in every case in which we have been successful we have had an absolutely symmetrical face as shown in the next slide.

For many, many years Dr. Brophy has been kind enough to show me every detail of this operation. The only objection to it that I have is that it is more difficult in most people's hands than it is in the hands of Dr. Brophy. We have trouble with our anesthesia. We have difficulty in getting our landmarks, getting our wires high enough and far enough back. I think we too often tilt the bones.

This is the first time I have ever seen Dr. Brophy have time enough at a meeting to discuss the subject fully. I have not been where he has been the guest of honor like this, where he had the whole meeting and where he could discuss all of the points. I am certain that if his message takes root in this audience and his enthusiasm is transmitted to us he is going to save a great many children in the future from carrying these defects through life. Of course Dr. Brophy cannot do all of these operations. I wish to goodness he could. In regard to that last picture he put on the screen in which the lips had been stretched to such an enormous size I would suggest that a "lipectomy" be performed.

DR. BROPHY (closing): Replying to Dr. Waldron, I no longer operate upon patients a few days old and for the reasons he gives. The child should live long enough be-

fore operation to have all organs functioning well. I depend upon a pediatrician to get the child into proper condition.

I did not hear anyone state what other method could be used in the case taken from James Barry in order to close the cleft. Isn't it proper to bring the bones into normal position? I do not agree with Dr. Waldron that a single wire will accomplish the reposition of the bones. It will not hold the tuberosities in position and we know that the soft palate cannot be depended upon to do so. I should like to ask Dr. Waldron if, in his work, or that of Dr. Ritchie, where the anterior closure alone had been made, the soft palate after operation was long enough to reach the post-pharyngeal wall. If it is not the patient will not speak well.

The most eloquent answer that can be made to the question brought up by Dr. Waldron regarding whether or not bony union takes place may be had by referring to Figure 11. It is so certain that bony union does take place that I have never heretofore thought it necessary to offer concrete evidence. If it was necessary, thousands of such cases could be presented.

Dr. Farr has spoken kindly about the work I have been doing. I have simply tried to be conscientious and do the right thing and yet I have been criticised a great deal and some of my friends think that I should be in jail.

In conclusion, I feel certain that the man who makes a success of this work, bringing about a condition which will enable patients to go through life with the nose in the center of the face, a completely closed cleft and articulating distinctly, will not do it by using a single wire in the front. Personal appearance and function are the essentials. I am not particular how you obtain the results but have tried to show a method of meeting the indications. It is a notorious fact that cleft palate cases, the world over, usually fail to receive efficient treatment.

THE NEED

One newspaper is quoted as stating that the most important happening in this country last year was the birth of 2,000,000 children.

How many of them lived? This is not known accurately, because there remain eighteen states which do not yet register their births! Of the thirty states in this country within the Registration area, one child in every thirteen born dies during its first year. If the same ratio applies to the states which do not register, we have a total loss of 190,000 American children a year.

That is startling, but it is a long way from the day when parents were considered fortunate if they were able to bring up two out of every three of their children.

Still, it leaves us behind five other nations, including New Zealand, the best off of all countries which keep books on their greatest asset, which loses only one in twenty of its children during the first year.

But there are things almost as bad as death. There are children unfitted or not half fitted for life. And there are hordes of them just enough handicapped physically or mentally to be drawn into the ranks of those who may labor long but receive little happiness or substance.

Here are some of the handicaps: The figures may be taken as approximately correct:

Studies made in many communities indicate that millions of American school children suffer from malnutrition or physical defects, most of which can be prevented and many of which can be corrected.

They range from seventy-five per cent with dental defects to one-half of one per cent with organic heart trouble, in between coming those with tuberculosis, defects of vision, etc.

Then, as to mothers:

According to the United States Census Bureau, 17,800 women in the United States of America died from conditions caused by childbirth in 1919. In 1920 the rate rose to eight per cent. Italy, crowded as she is, has a rate of only five per cent lost mothers.

Sixteen nations save more mothers than we do.

To focus attention upon the above facts, without at the same time attempting to indicate some of the ways out, would be of little service. May Day, which is celebrated by children in many communities, perhaps offers the best opportunity to combine incentives to increased outdoor life for children with efforts toward a knowledge of what to do next in Child Health and Child Health Education.

FACTORS OF SAFETY IN GASTRIC SURGERY*

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The general principles of surgical treatment are more or less established, but the results of the application of these principles vary considerably in the hands of different surgeons. Operative mortality is always the first question in the mind of the patient to whom operation is advised, and, while it is of secondary importance in certain life-saving emergency operations and in malignant disease, it is of first importance to both patient and surgeon in operations of election. Remarkably low operative mortality rates are now possible in various fields of major surgery, even when the surgeon accepts his full responsibility and does not sacrifice the interests of the patient to a desire for low operative mortality records.

In surgery of the stomach and duodenum, the question of operative mortality is one of supreme importance because of the frequency of non-malignant conditions, such as duodenal ulcer, in which operation is carried out to relieve serious symptoms and not to save life, except in the occasional case. The safety with which operation for such conditions can be performed is shown by Moynihan, who reports nearly 600 consecutive gastro-enterostomies for chronic duodenal ulcer without a death. It is important, therefore, that surgeons keep such achievements in mind and become thoroughly familiar with the factors of safety which make such accomplishments possible.

The first factor of safety is concerned with the indications for operation, the risk which the operation entails, and the measures which may be employed to lessen the risk. In non-malignant surgical lesions of the stomach (chronic ulcer) the advisability of operation is usually clear, and comparatively rarely do real contraindications exist. Experience has shown that all chronic gastric ulcers should be operated on without unnecessary delay, because the risk of operation, which should not be greater than between 2 and 3 per cent, is insignificant compared to the danger of a permanent disability,—a disability which not infrequently progresses to a fatal outcome. In the few cases in which operation was not advised, other conditions such as

tuberculosis, nephritis, or cardiac disease, were so advanced as to prohibit an operation of election, and surgical treatment was postponed in the hope that the patient's condition might sufficiently improve, under treatment, to permit operation for the ulcer later with a reasonable degree of safety. In duodenal ulcer, neither the disability nor the danger of serious outcome is sufficient to warrant advising operation with the same emphasis as in gastric ulcer. Nevertheless, experience has again shown that the low risk of operation, 1 + per cent, and the excellent results of surgical treatment properly carried out leave no justification for non-surgical measures ineffectively prolonged. Complications such as hemorrhage, perforation (acute and chronic), obstruction, and malignant degeneration remove any doubt that may exist as to the necessity of operation. Because duodenal ulcer is a much less serious condition than gastric ulcer, factors which would have little or no weight in considering the advisability of operation in gastric ulcer attain considerable importance when duodenal ulcer is present. Consequently, contraindications to operation are seldom found in gastric ulcer, while in duodenal ulcer it is not uncommon to find that the circumstances justify postponement of operation. Various reasons are noted for advising against, or postponing, operation in cases of duodenal ulcer, such as extremes in age, short history, mild attacks at long intervals, positive x-ray findings without symptoms, marked obesity, serious cardiac, pulmonary, or renal disease (the ulcer being only an incidental finding), and the occupation of the patient. Selection of cases, therefore, is based not only on the operative risk, but on the severity of the symptoms and whether they respond sufficiently to medical management to keep the patient comfortable and self-supporting.

In malignant lesions (carcinoma) an entirely different problem exists, because the only hope of saving the life of the patient is by operation. Risks which would be quite unjustifiable in cases of non-malignant gastric lesions become justifiable in cases of malignant lesions. The surgeon, with increasing experience, is led to accept greater and greater risks in cases of gastric malignancy, because of the hopelessness of the disease without surgery, and because he is able to recall unexpected successes in cases in which there appeared to be little or no chance to remove the growth. As a consequence, it is difficult to keep the operative

*Read before the Annual Meeting of the Minnesota State Medical Association, St. Paul, October 10-12, 1923.

mortality of gastric resection for carcinoma under 10 per cent, and the mortality rate could probably be reduced one-half, if only patients in good condition and with moderately advanced lesions were accepted for operation. In cases of cancer of the stomach, unless the disease is obviously incurable because of metastasis, the conscientious surgeon must, to a considerable extent, follow the wish of the patient, a practice which does not contribute to a low mortality rate. Although radical operation is seldom indicated if there is metastasis, it should be noted that patients may live three or even five years after the removal of cancer of the stomach, which is already associated with metastasis to the liver.

A decision as to the advisability of exploration in cancer of the stomach has been greatly simplified by the radiologic examination. In the Clinic, Carman and his associates have graded gastric malignancy into three groups: (1) operable, (2) questionably operable, (3) inoperable. Of the operable cases, 50 per cent, so far as the growth was concerned, were found to be suitable for resection; of the questionably operable, 18 per cent; and of the few inoperable cases in which exploration was performed, 12 per cent were resected.

Patients with peptic ulcer do not, as a rule, require elaborate or prolonged preoperative preparation. If the condition is uncomplicated and the patient is in good general health, operation may be carried out without delay. If complications exist, or have existed, preoperative preparation will be instituted according to the nature of the complication. Obstruction at any point in the stomach sufficient to cause a retention of 300 c.c. necessitates gastric lavage, repeated for several days until the washings are clear; the stomach is thus kept clean up to the time of operation. The administration of barium for fluoroscopic examination is to be avoided in all cases in which gastric retention is shown by the history or by the test meal. Water should be given routinely in cases of obstruction, the amount varying with the degree of dehydration. Patients with marked anemia due to recent or recurring hemorrhages should be put to bed, a bland diet established, and transfusions given until the hemoglobin has been raised to 50 per cent, if possible. When the patient ceases to respond to transfusion, even though his condition is not so good as is desired, further delay is useless and inadvisable. Operation during gastric hemorrhage should

usually be avoided, not only because of the added risk, but because such hemorrhage may occur in the absence of any recognizable mucosal defects and under circumstances which strongly suggest ulceration. Recovery is the rule following a single attack of hematemesis, and the exceptions to the rule would not have been saved by emergency surgery. The best practice in cases of gastric hemorrhage is to keep the patient under observation until recovery from the effects of the hemorrhage has progressed to its maximal point, or at least to a point at which operation can be carried out with reasonable safety. If the patient is recovering from the effects of one hemorrhage and another gross hemorrhage occurs, or if he is losing ground because of continuous oozing, and an ulcer is known to be present, transfusion, followed immediately by operation, is advisable. The recent publications of Finsterer, showing the results of operation for gastric hemorrhage, deserve careful consideration, and may ultimately modify our present views.

The anemia associated with gastric malignancy does not often respond satisfactorily to transfusion, and little or no benefit may be expected from it. Severe anemia in gastric carcinoma is an unfavorable sign, particularly when associated with edema. The preparation of the patient who has cancer of the stomach consists chiefly in restoration of fluids, cleansing the obstructed stomach, and limited rest, but no marked improvement can be expected from preoperative treatment, so that its prolongation is unnecessary and unwise.

The chief factors of safety are in the conduct of the operation itself. The question of the anesthetic arises first. It is difficult to prove by statistics the relative value of the various anesthetics. In the Mayo Clinic, local anesthetic does not appear according to statistics to be a safer anesthetic than ether, but comparison by statistics is unfair because local anesthetic is usually employed for the poor surgical risks, and ether for the good surgical risks. It is, therefore, true that the operative mortality under such practice is higher with local than with general anesthesia. There is no doubt, however, that local anesthesia, combined if necessary with a small amount of general anesthesia, is of less risk to the patient, and especially to the patient in poor condition. The early reports concerning the new anesthetic, ethylene, and our own experience with it, indicate that a step forward has been taken in the field of anesthesia.

The first rule of safety is that the operation should be completed as expeditiously as is consistent with careful work. Speed should not be carried to excess, nor should care in detail reach the point of fussiness. One of the characteristics of the good surgeon is that he does not underrate the relative importance of time and attention to detail, particularly hemostasis. Gastro-enterostomy, in the uncomplicated case, can be properly performed in twenty minutes, and partial gastrectomy can be performed in little more than half an hour.

The next factor to insure safety is the selection of the operative procedure best suited to the lesion. Operative mortality, or more often postoperative morbidity, can often be attributed to failure to make the proper selection. The best results in gastric surgery will be attained by the surgeon who is not only familiar with the indications for the various operations, but is capable of properly carrying them out. As illustrations of wrong selection of operation, one may cite: forcing a posterior gastro-enterostomy when adhesions obliterate the lesser sac of peritoneum, or fix the first loop of jejunum; mobilizing a pyloric or duodenal ulcer which has perforated and become adherent to the liver; failing to free an ulcer which has perforated posteriorly and become adherent to the pancreas; neglecting to excise the ulcer which has been associated with hemorrhage; failing to resect the large ulcer which is, or probably will become, malignant; and partial gastrectomy for malignancy so advanced that the diseased tissue cannot be entirely removed. Such errors may be made because of poor judgment, but mistakes such as anastomosing the stomach with the transverse colon or with the terminal ileum, are examples of errors due to ignorance or inexperience, or both.

Having selected the operation best suited to the particular lesion, the next and most important factor of safety is its proper performance. Any operation on the stomach should be so performed that gastro-intestinal function is well preserved. The fundamental principle in the surgical treatment of ulcer is adequate drainage. Whatever anastomosis is made, therefore, should be large, properly placed, and protected against subsequent interference in its function. A small anastomosis invites failure to secure for the patient the symptomatic relief he should expect, and not infrequently requires secondary operation. An anastomosis which is not at the most dependent part of the stomach

does not provide the best drainage, and is at least relatively inefficient. To prevent subsequent contraction of the anastomosis, it must be free; hence all anastomoses should be made through a wide opening in the mesocolon, and the opening in the latter closed by suturing its edges to the stomach in such a way that the anastomosis hangs well below the opening in the mesocolon. In cases of gastrojejunal ulcer, it is common to find the mesocolon fixed to the line of anastomosis, suggesting that such a relationship was a factor in the occurrence of the secondary ulceration. Of great importance from the standpoint of both safety and good results is the avoidance of tension. A gastro-enterostomy may fail because of too short a proximal loop, and a suture line may give way after an extensive resection because tension on the line of anastomosis has not been relieved by reinforcing sutures, or because some other method of restoring gastro-intestinal continuity would have been preferable.

Another most essential factor of safety concerns the control of hemorrhage. Postoperative hemorrhage after operations on the stomach may occur, but there is no doubt that serious bleeding from suture lines is unnecessary, and when it does take place from a cut edge of the stomach or intestine, the surgeon must accept the fact that it could have been prevented. If clamps are used, they should be loosened after the first row of sutures is placed posteriorly, and all vessels that can be caught and ligated are so dealt with. The anastomosing suture should be held taut and carefully placed without too much tissue intervening between the stitches, and, in regard to the latter point, especial care should be taken at each end of the anastomosis where it is occasionally a temptation to invert an excess of stomach or jejunal edge with one stitch. Postoperative hemorrhage may and does take place from an unremoved ulcer, and may be sufficient to cause death, but such cases are exceedingly rare; I have seen one in several hundred operations for ulcer. The surgeon should be able to feel certain, from the care he has taken in performing the anastomosis, that any postoperative bleeding is not from the suture line. Finally, the control of sepsis as a factor of safety is of relatively less importance, because infection from the contents of the stomach, duodenum, or upper jejunum is not likely. Nevertheless, it is significant that those who report the best results in gastric surgery are the most careful

in walling off the operative field by suitably arranged pads.

POSTOPERATIVE MANAGEMENT

The care of the patient after operation on the stomach or duodenum is first directed toward the prevention of pulmonary complications. Mortality after gastric surgery is usually due, directly or indirectly, to chest complications. Chilling of the body surface should be guarded against during and following the operation. Particular care should be exercised in moving patients from an overheated operating room, through draughty halls, and into a room where the temperature is several degrees lower than in the operating room. Pneumonia, due to aspiration of mucus, or vomiting during recovery from the anesthetic, is a real danger that can usually be avoided by strict postoperative attention. Fluids by rectum should be given routinely, and in serious risks should be augmented by hypodermoclysis. Fluids by mouth may be given twelve hours after operation in the ordinary case, but recent experience in providing absolute rest for the stomach by allowing nothing by mouth for a period of four or five days after operation, with the judicious use of morphin, has led us to adopt the practice. Undoubtedly, the convalescence is now easier than under former methods of treatment, at least following more extensive operations on the gastro-intestinal tract. This is especially true after extensive resections, where only a small portion of stomach remains, the distension of which by too much fluid would place a dangerous strain on the suture line.

Acute dilatation of the stomach, a serious postoperative complication if neglected, is promptly relieved by the use of the stomach tube. There should be no hesitation in passing the tube if there is any suspicion that an acute dilatation exists, and this may only show itself in a rapid pulse. If gastric retention occurs during convalescence, due to poor motility, the stomach should be emptied and kept so until it has regained its tone.

If oozing takes place into the stomach, gastric lavage with water of 120° is by far the most efficacious measure, and without danger if carefully carried out. Removing partially coagulated blood from the stomach enables it to contract so that normal clotting in capillaries of the mucous membrane may more easily occur. Such lavage may be repeated as necessary. Should obstruction at the anastomosis occur and not respond to lavage,

prompt entero-anastomosis should be performed. In any complication which may arise during convalescence, the earlier its recognition and the more prompt its treatment, the more successful is its control.

DISCUSSION

DR. A. C. STRACHAUER, Minneapolis: The consideration of the factors of safety in surgery is always very important and particularly so in the field of gastric surgery because gastric surgery is really major surgery. Then, again, due to the better results being obtained gastric surgery is increasing in quantity. The stomach operation has become of very frequent occurrence.

In my own practice I consider the pre-operative care and preparation of the patient of the very greatest importance; in fact, as important as the pre-operative preparation of the case for prostatectomy. This is not generally appreciated. I do not alone refer to the obstructed patient who is dehydrated, starving and on the verge of acidosis, but to the ordinary routine case of ulcer of the stomach or duodenum. It is a mistake to operate upon ulcers which are active, which phase may be appropriately termed a crisis. While the ambulatory treatment at times suffices, these people should usually be put to bed, preferably under the direction of a gastroenterologist or medical practitioner, and placed on an ulcer management regime. Response to any of the standard medical ulcer treatments is usually very prompt, and in a varying period of time the ulcer becomes inactive. Many active ulcers which are non-resectible, due to the surrounding area of infection and inflammation, when inactivated become safely resectible. The medical treatment also builds the patient up generally, with increase of resistance. The eradication of the ulcer not only greatly increases the percentage of cures, but protects the patient against the occurrence of hemorrhage, perforation and malignant degeneration. As a matter of fact the microscopic examination of simple benign ulcers every now and then shows the same to have been malignant. The post-operative morbidity of gastroenterostomy is in a large measure due to the mechanical activation of the ulcer due to manipulation and traumatization at the time of the operation. This is obviated by gentle handling of the structures and by resection of the ulcer whenever possible. I find that we are resorting more and more to transfusion in the preparation of our patients, not alone in the cases with hemoglobin below 30 per cent but in the individual with hemoglobin of 60 per cent or more who has the appearance of being asthenic. The latter patient is transfused so that he may receive the benefit of the "kick" that is contained in the transfusion and so withstand the operation better. All patients scheduled for major gastric interference are grouped for transfusion whether they require the same or not.

Employment of the trap door incision, that is, a combination of the transverse and the longitudinal incisions, giving the most ample exposure possible, is, in my opinion, a factor of safety in gastric surgery, particularly in attacking ulcers high up on the lesser curvature.

Dr. Balfour refers to pneumonia as a factor in carrying off these patients. I believe that the routine practice of

having the patients sit up with a back rest on the first day after the operation, or even on the day of the operation, is an important aid in decreasing the incidence of pneumonia.

Dr. Balfour has given this subject thorough consideration, and there is no occasion for my going over and enumerating all the various factors which he has so well called to your attention and sufficiently emphasized.

DR. ARNOLD SCHWYZER, St. Paul: When one hears this paper one feels that here a man of experience sits up and thinks: "What is really now the most important in all this gastric surgery? What can still improve the already splendid results?" As Dr. Strachauer says, there are so many things mentioned in this paper that one cannot go through them all; one can only emphasize a few. For instance, the value the Doctor laid on resecting gastric ulcers. That was brought home to me in a very vivid way in a recent case where we resected. Now I thought I had experience in judging pathological conditions. When I cut that resected piece open, I said: Here are two beautiful, fine, round ulcers, as classical as they can be, one with a diameter of a centimeter, the other considerably smaller. But when we cut through them, we became a little suspicious. The larger one was showing a little thicker base than we were used to seeing and microscopically it was a very plain carcinoma. That shows the good judgment in resecting all those cases of gastric ulcer.

The Doctor said in his paper that if a bad hemorrhage occurs after the operation, we have to consider ourselves guilty. I think in suturing with the continuous suture if one goes around the larger vessels, makes a loop around them, he can do much in preventing that.

In bleeding before the operation—I again can only emphasize what he said, that is, when it is necessary or desirable to transfuse, to do the operation immediately afterward; in fact, to leave the patient on the table and proceed to operate has seemed to me the most desirable. Especially those cases of small, continued, or frequently repeated bleeding, where even with a strictest diet we do not get stopping of the bleeding—I think with those we should not wait long before we go at them.

About the short loop operation the Doctor has mentioned—it always strikes me that there the main cause of trouble is the pulling of the no loop end, that is, the distal end. We then really stretch the anastomosis opening so that the upper end is the direct channel. I have long used a device to counteract vicious circle. When you make your gastroenterostomy, you make the outlet free if you make the sutures grasp a broader surface toward the upper end. With these wider sutures, you constrict the inlet, get a better and broader union at the upper end and produce a little kinking off of your inlet.

About postoperative pneumonia and respiratory difficulties. It is painful to hear the patients under ether in some hospitals—the noise they make with the mucus in the trachea. That of course is awful. The local anesthesia in gastric surgery is, as the Doctor said, a distinct step ahead, especially if we do not insist too much on it but use it with perhaps at times some ether. After the operation very often those patients fill up and then I have felt that it was a great help to use a little trick. I come

into a sick room and I see the patient would like to cough but he does not dare to cough on account of pain and he cannot cough. The only way to help these people is if I get a good hold of them on the sides of the abdomen near the field of operation, and ask them to cough. When they cough I press hard so that at the same time I not only help them to cough, but that relaxes the stitches and they can cough with hardly any pain. I have very often gotten out large masses of phlegm that they had there for hours and could not get rid of. I think I have saved the life of at least one patient by this. The nurse is instructed how to hold and how hard to press at the moment of coughing.

DR. WILLIAM J. MAYO, Rochester: I would like to speak of two points that were brought up in Dr. Balfour's paper: In case of a severe hemorrhage from ulcer, I think it is not wise to operate immediately following the first hemorrhage, since, if patients die from acute hemorrhages, they do not die usually until they have had the third hemorrhage. This was pointed out in the old pre-antiseptic days with regard to the secondary hemorrhages from infected thrombi. If, therefore, the patient has but one hemorrhage, I think it wise to wait. If they have a second hemorrhage as severe or approaching the severity of the first, I believe it is wise to transfuse, as Dr. Schwyzer says, on the table, and to operate at once. In operating there is only one thing to do, that is, open freely at the site of the ulcer and find the bleeding point. Gastro-enterostomy, as a rule, will not avail. The hemorrhage will usually be found coming from a short, straight blood vessel in the posterior wall, often in pancreatic tissue. About one ulcer in eight that bleeds before operation will bleed after operation. These are very trying cases. The rule now is that if patients relapse several times, it is wise to resect the pyloric end of the stomach, where the ulcer starts either on the duodenum or on the stomach.

We have been quoted a great deal with regard to the question of cancer on ulcer. Our experience is based, not on all patients that come to the Clinic with cancer of the stomach, but on the patients that are actually operated on for cancer of the stomach. We have been quoted as saying that 71 per cent of cancers of the stomach had their origin in ulcer. I doubt whether even 25 per cent of cancer of the stomach observed consecutively could be actually shown to have their origin in ulcer, but that ulcer of the stomach is a serious disease and more serious than ulcer of the duodenum, and that it often precedes cancer, we cannot doubt. The great life insurance companies were anxious to know whether patients on whom operation had been performed for ulcer of the stomach and duodenum were insurable, and Mr. Hunter, the Vice President of the New York Life Insurance Company, came to our Clinic and with his own actuaries investigated the records of about three thousand patients who had been operated on for ulcer of the stomach and duodenum. Then through the medical examiners of the life insurance companies, these patients were traced, and as far as possible examined; thus accurate data were obtained concerning the actual results. They were able to trace about 90 per cent of the patients, and found that five years after operation on the duodenum for peptic ulcer the death rate was, if anything,

less than that among the average insurable persons of the same age. The death rate five years after operation for ulcer of the stomach was two and a half times the normal death rate at the same period of the average insurable persons.

DR. THEO. BRATRUD, Warren: Dr. Balfour's paper could not of course cover the whole field of gastric surgery. There is one type of gastric surgery which I wish to comment upon. That is an acute perforation of the stomach or duodenum. We have had several consecutive cases without a death. In every one of these cases we performed a jejunostomy and closed the perforation. As I understand it, there is a great deal of dispute as to whether a gastroenterostomy should be done in an acute perforation or not. When jejunostomy is done you can pour in a pint of water into the bowel right on the operating table; or you can start feeding them the next day with milk and glucose and whipped eggs. And another nice thing about the jejunostomy in these acute perforations is that they have no distension of the stomach, and very few of them have to have any postoperative treatment for gas distension.

We had trouble with two out of nine cases where we did a jejunostomy in acute perforation. One had a gastroenterostomy about a year after his perforation, and the other one had quite a severe hemorrhage from the stomach. Another case on which we did a jejunostomy for acute perforation had had a gastrotenterostomy some twenty years before for duodenal ulcer. At the time of the operation we found a large duodenal ulcer right under the pelvis of the gall bladder. We found the gastroenterostomy functioning properly, in perfect condition. This man was sixty-five years old. His convalescence was perfect.

I think the Doctor called attention to the large ulcer on the lesser curvature. We had one case with a high ulcer that we used the Balfour cautery and found so wide an ulcer after exposing that a sleeve resection seemed necessary and I presume that is what Dr. Mayo would have done under the circumstances. The man was not in very good condition, and we did a jejunostomy and we fed him through a tube for six weeks. He gained a great deal in weight. He had suffered so much pain prior to his operation that we were afraid of operating on him—we had examined him very thoroughly—for fear he had some spinal tumor on account of his severe pain. But this man was so satisfied with the tube that he was unwilling to have the ulcer removed when we took the tube out. He has gotten along nicely now for two years.

DR. A. C. STRACHAUER, Minneapolis: I am very glad that Dr. Bratrud brought up the question of the surgery of the perforated gastric ulcer. I must say that a great deal of harm has been done by the teaching in which gastroenterostomy is recommended routinely in cases of perforated gastric ulcer, particularly in the hands of the general practitioner and in the hands of surgeons of limited experience working under situations and circumstances that are not the most auspicious for the performance of gastric surgery. I want to go even one step farther than Dr. Bratrud, my opinion being based particularly on two cases that I had the opportunity to come in contact with

this last year. First, let me say that the indication as far as surgery is concerned in the perforated ulcer is to "get in and get out." It is my own practice simply to close the ulcer, resecting the margin if necessary to get a good closure. But anyone with experience in a perforated gastric ulcer knows how extremely difficult it may be to suture the wall of the stomach beyond the ulcer. It is inflamed; it is infected. Sutures do not hold; they pull through just like through cheese.

This last year I had the satisfaction of seeing two cases, operated upon out in the smaller towns, in which the general practitioner had the good judgment to open the belly, stick a rubber tube in the perforation opening in the stomach, put in a stitch or two, and close the belly and be satisfied with it. The thing to do is to get in and get out. Do not do too much. I know to my own satisfaction that it is unnecessary to perform the gastroenterostomy.

DR. DONALD C. BALFOUR, Rochester (closing): I appreciate very much the discussion of this paper. One of the points deserving emphasis was that made by Dr. Strachauer regarding the inadvisability of operating on patients with gastric ulcers when they are very ill, that is, when they are going through an acute exacerbation of symptoms. The remarks that Dr. Schwyzer made about the resection of ulcers could also be especially emphasized. Certainly, the nearer one can approach a routine resection of a gastric ulcer, the better will be the results. Dr. Schwyzer also has drawn attention to the necessity of avoiding tension on the suture line and described his simple method of doing so.

I might supplement what Dr. Mayo said about the study made by the Actuarial Society to this extent: the first thing that comes to one's mind when he learns the result of this study is, "What was the cause of death in patients who died following operation for gastric ulcer?" As Dr. Mayo said, the patient who has been operated on for duodenal ulcer was shown by actual figures to have a little longer expectation of life than one of similar age and sex in the general population group, and in gastric ulcers the subsequent death rate was about two and a half times as much.

I took occasion, when this report came out, to investigate as well as I could the cause of death in the latter group, and it was astonishing to learn of the number of patients who had died of cancer afterwards. And then as you review the operative records of those patients who had died of cancer, you will find that a large proportion had had only a gastroenterostomy done for a large, irremovable lesion, presumably gastric ulcer. The lesion was usually attached to the pancreas, and the surgeon felt that it was not possible, or not feasible, to attempt to get a section of it. Those patients did well for a few months, then began to lose ground, and a report came within one or two years that they had died of cancer. It is reasonable to suppose that they had cancer at the time they were operated upon. If one eliminates that group from the entire group of patients who have died after operation for gastric ulcer, he will find that the expectation of life is very much better than was found by the Actuarial Society.

I would also like to add my compliments to Dr. Bratrud for that excellent suggestion of jejunostomy in the treatment of perforated gastric ulcers.

SOME PHASES OF THE GLAUCOMA PROBLEM*

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The observation that the condition of glaucoma is so frequently overlooked not only by the general practitioner, but also by men professing to practice ophthalmology, and even when recognized or suspected, is so frequently neglected or imperfectly treated, has prompted me to offer a few remarks on this subject that has been such a favorite theme for study and writing of ophthalmologists.

There is so much to say on such an important topic and all that is known of it has been presented in the literature so much more ably than I can hope to do, that it is with some hesitation that I venture to offer it as the subject of a paper that your chairman has dignified on the program as an address.

It is only because of the hope that some observations on the subject that have been impressed upon me after considerable study of such cases and experience in their treatment, may stimulate some of the younger men to more careful study and examination of this really difficult subject, that I feel justified in presenting it before your society.

In considering the subject of glaucoma we should get away from the idea that has so long obtained and that is still held in most text-books, that we are dealing with a disease entity.

While glaucoma is indicative of an abnormal condition of the eye, it is more accurately a syndrome, a symptom complex, the chief feature of which is intra-ocular pressure.

The accumulated experience and observation of many students of this subject demonstrate the complexity of the pathologic condition that may underlie glaucoma.

The division into inflammatory and non-inflammatory, acute, sub-acute and chronic or simple forms is the natural sequel of considering the condition as a disease *per se*, and is confusing. Much to be preferred is the simpler nomenclature of congestive and non-congestive forms adopted by Elliot and other writers on the subject. Non-congestive

forms, as we know, may, under favorable conditions, become congestive.

Hypertension, increased intra-ocular pressure, is universally recognized as the dominant feature of this condition and the one that demands our closest attention in the study and treatment, but underlying this may exist pathologic changes and conditions so diverse and complex as to defy our efforts to elucidate them.

PROBLEMS OF ETIOLOGY

In the study of the etiology of glaucoma we are confronted with difficulties from the outset. A knowledge of Pathological Anatomy assists in the study of pathogenesis. In this subject, the lack of material for studying the earliest stages of glaucoma increases our difficulties. Most of the glaucomatous eyes that come to section are those in the latest stages, and we are not warranted in concluding that these conditions found are those of cause and not of effect.

I assume we are all familiar with most of these changes or at least with the most prominent ones.

The shallow anterior chamber, the filtration angle blocked by the root of the iris, the atrophied iris, the swollen ciliary processes, edematous cornea, the engorged ciliary vessels, the cupped optic disc, the cavernous atrophy of the optic nerve, all these and more have been accurately and carefully observed. But it is difficult to answer the question: "Are these the cause or the effect of the increased intra-ocular pressure?"

There is little doubt that age is an important factor in the etiology. It is a common observation that most cases of glaucoma occur in middle and late life, and statistics confirm this.

For instance, in the analysis of a series of 1,032 cases of primary glaucoma Haag found that four occurred in the first decade of life, 16 in the second, 26 in the third, 74 in the fourth, 176 in the fifth, 288 in the sixth, 329 in the seventh, 116 in the eighth, and three later.

These figures are in accord with the observations of Priestley Smith on a series of 1,000 cases collected from the practice of a number of surgeons.

But in what way does age influence the intra-ocular pressure? Priestley Smith, one of the most profound students of this subject, has shown that the lens grows larger with advancing life while the size of the eyeball remains the same or possibly becomes somewhat smaller. He claims to have demonstrated that the ciliary processes are more

*Read by invitation at the meeting of the Minnesota Academy of Ophthalmology and Oto-laryngology, St. Paul, Minn., Jan. 17, 1924.

prominent and bulky in the old than in the young. With the increase in size of the processes and the lens, the circumlental space is correspondingly narrowed so that fluids cannot so readily pass from the vitreous into the aqueous chamber.

In consequence the lens and swollen ciliary processes are pushed forward against the iris, the root of which blocks the filtration angle and thus impedes or stops the outflow of fluids through the spaces in the pectinate ligament. Of course this would explain the shallow anterior chamber which is one of the well recognized signs of an established glaucoma.

Thickening or sclerosis of the fibers of the pectinate ligaments as pointed out by Henderson may contribute to this result. As a consequence of such thickening, which may be one of the manifestations of fibrosis incident to advancing life, the lymph spaces in this structure may be seriously contracted so as to be inadequate for the circulation of lymph.

Valuable as is the knowledge of these factors in the production of glaucoma, the ultimate cause is not yet known. What brings about the enlargement of the ciliary processes? Is such an enlargement in the nature of an inflammatory condition? Is there associated with it an increased secretion of fluids which the circulatory system of the eye is unable to take care of, thus raising the intra-ocular pressure? If there is an increase of fluids in the eye are they in any way changed in their physical or chemical nature? What rôle do vaso-motor disturbances and nervous irritations, so common in the period of life when glaucoma occurs, play in the problem? Do degenerative changes in the uveal tract, particularly the ciliary body, bring about increased or altered secretions in the eye? What influence do various morbid states that result in auto-intoxication have in bringing about such degenerative changes in the ciliary body?

These and various similar questions are engaging the attention of the students of the subject and have not yet been satisfactorily answered. Possibly they may never be answered, associated as they are with some of the most intricate problems of metabolism.

In truth, the etiology of glaucoma is hydra headed. In the last few years writers on the subject seem to have found reasons for denying any causative relation between arteriosclerosis and glaucoma. One cannot escape the thought, however, that a condition like arteriosclerosis that so profoundly

affects the welfare and nutrition of tissues, may play a rôle in bringing about degenerative changes in the eye, particularly if the ocular vessels are so affected, that may lead to the results that we are considering, viz.: hyper-secretion of fluids and alteration of such secretions. Of course, this is, at present, mere speculation.

Appropriate in this connection are the admirable words of the late S. D. Risley on the subject of Etiology: "Glaucoma is a disease, coming on at an age when wear and tear, harassing vicissitudes, misfortunes, exposures, overwork and vicious living have sapped the physiologic foundations of life; when infections have found entrance to the structure of the organism through the doorway of the epithelium; and when a variety of toxic, auto-intoxic and other influences have set up vascular and cardiovascular disease, associated nephritis, uveitis, high blood pressure, etc. Glaucoma, in fact, rarely occurs in individuals in good general health."

DIAGNOSIS

The diagnosis of congestive glaucoma should not be difficult even in the early stages, when we consider the distinct signs that it presents. And yet we can all recall deplorable cases that have been overlooked by the optometrist, and also by the general medical practitioner, in which the eye has been greatly jeopardized or possibly lost in consequence of such an error. Ignorance in regard to this dreaded condition should not exist. General physicians should be impressed with the importance of the early recognition of it, and, although they may do no ophthalmic work, should be able to recognize it, or at least in more insidious cases to suspect it and to refer the case to the specialist for exact diagnosis.

Errors of recognition are not necessarily due to ignorance, but may result from oversight because of the multifarious duties the general practitioner must assume. I recall a recent case under the care of a physician of no mean attainments, which was being treated for persistent vomiting. The eye had distinct congestive glaucoma, but was not painful although the sight was much impaired.

Such experiences are not uncommon and suggest the importance of impressing upon the general physician the necessity of examining the eyes as a part of his general examination of a case. This would be borne home to them if they realized that

at least one per cent of the cases in an eye clinic or in private practice are glaucoma.

No difficulty should be encountered by the specialist in the diagnosis of congestive glaucoma especially if it is once established or is in an acute stage. The signs and symptoms, all produced by the increased intra-ocular pressure are so familiar to us that they scarcely need more than enumeration on this occasion. Steamy, insensitive cornea occasioning rainbow phenomena around lights; faint ciliary congestion in acute stages and engorgement of ciliary veins that penetrate the anterior portion of the cornea; shallowing of the anterior chamber and oval enlargement of the pupil; more or less haziness of the media in consequence of which and also in consequence of the pressure on the retina there develops impairment of central and peripheral vision; if the condition has existed for any length of time, more or less cupping of the optic disc with possible pulsation of veins or arteries or both; in the acute stages, because of the haziness of the media, impossibility of seeing the details of the fundus; pain of varying degree, according to the intensity of the acute attack, sometimes in the eyeball, sometimes simulating a facial neuralgia, or occasionally dull and ill defined, or of a nature to reflexly excite nausea and vomiting; marked hardness, increased tension of the eyeball as determined by palpation or with instruments; all of these signs and symptoms form a clinical picture that the specialist readily recognizes as acute or congestive glaucoma.

There may have been prodromal signs before the attack, but the glaucomatous condition even then must have been present. I like the classification of stages used by Elliot of early glaucoma, established glaucoma, and late glaucoma, instead of prodromal, acute, chronic and absolute of most writers.

It is in the non-congestive forms of glaucoma that problems of diagnosis present that are often difficult to younger practitioners in ophthalmology, particularly in those cases of so-called simple glaucoma, in which the intra-ocular pressure is not at all times measurably increased. These are the cases that frequently puzzle us in diagnosis and raise questions as to treatment. Frequently they present little or no impairment of central vision; the onset of increased intra-ocular pressure has been insidious and its progress slow. The first intimation of anything wrong may be the discovery

in the routine examination of a cupped disc, and then further examination elicits the glaucomatous condition. Or the patient may complain of dull pain, again of neuralgic pains in and around the eyes at times, blurring of the vision when reading as if his glasses do not fit. Such symptoms may indicate disturbances of accommodation from congestion of the ciliary body, or disturbance in the refractive power of the lens from increased pressure. It may occur in myopes as well as hyperopes.

Probably in these cases of so-called simple glaucoma the increase in tension is not constant, but intermittent. Before the days of more accurate testing of tension with the tonometer, there was question as to whether many of these simple glaucomas manifested any increased tension, it being too slight to be noted by digital examination, but careful tests with the tonometer reveal that, at times, increased tension exists.

It is in such cases that we must arrive at the diagnosis by a study of the visual fields, the central vision, the appearance of the optic disc and a record of the tension as taken with the tonometer at various times.

The fields for white and colors, particularly red and green, should be taken, not once, but frequently, to record the progress of the case. They should be taken by the same observer each time, and as far as possible under the same conditions as to light, environment, background, etc., for there is no examination that admits of a greater chance for error on the part of both patient and observer than a perimetric examination of the visual fields.

We are all familiar with the various irregularities and contractions of the fields that present in simple glaucoma, but certain features stand out prominently enough to make definite characteristics. The contraction of the field is usually, although not invariably, found on the nasal side. It may be more marked above or below, depending upon the pressure upon the optic nerve. It is my opinion that the position of the physiologic cup, whether central or temporal, may determine in the beginning the character of the shrinking of the visual field. It is well to record in our histories, in routine examination of cases, a brief description of the position, size and depth of the physiologic cup for future reference and comparison.

With the continuance of the intra-ocular pressure the contraction of the visual fields proceeds until final blindness is reached. The color fields

usually contract concentrically with the field for white, but atrophic processes in the optic nerve may alter this rule.

The blind part of the field, sooner or later, is found to be in contact with the blind spot of Mariotte as first pointed out by Bjerrum, and both relative and absolute paracentral scotomas of Seidel may be demonstrated merging with the blind spot of Mariotte.

To map out these defects one must use small objects of 1 mm. or 2 mm. on a Bjerrum screen or the excellent instrument devised by Dr. L. C. Peter, the campimeter, which I find convenient. Lloyds' stereocampimeter, made by Bausch and Lomb, is even more useful in cases that have binocular single vision. The discovery of Bjerrum's sign and the scotomas of Seidel doubtless furnish valuable testimony in the diagnosis of early glaucoma, but, as has been said, it is a method of examination that must be accurately done to avoid error.

TONOMETRY

We must always hold to the central feature of glaucoma, increased intra-ocular pressure. Without increased pressure there could be no glaucoma; with it, all the manifestations of glaucoma may present, depending upon the degree and the continuance of the pressure.

In simple glaucoma, the pressure may not be great, but it may be continuous. In some cases it may not be continuous, but may be intermittent.

The tonometer enables us to determine this with more accuracy than can be obtained with the fingers. Furthermore, a record of observations can be made so that comparisons can be made from time to time as to the condition of the pressure, which could not well be done with digital examinations.

In this lies one of its great values.

With any form of tonometer errors may arise from inaccuracy of technique, and with any of them, however carefully calibrated they may be on the basis of manometric measurements of normal intra-ocular pressure, there will be variations in results arising from such conditions as rigid or flaccid cornea, slight keratoconus, high astigmatism, regular or irregular, corneal scars, etc. Its value is a relative one. It may or may not give us an accurate reading of the intra-ocular pressure in terms of millimeters of mercury, but it will from

day to day or week to week, if properly used, give us on the same patient the relation of impressibility of the eye to intra-ocular pressure.

My preference is for the Schiotz instrument because of its lightness and accurate construction. The patient should be lying flat on the back, so that the face may be in the horizontal position. One per cent holocain or butyn solution is used to cause anesthesia of the cornea. The patient is asked to fix some object on the ceiling so that the instrument can be placed exactly vertical on the cornea, the foot plate occupying the exact center of the cornea. Failure to do this will give inaccurate readings. I have noticed that two may work together to good advantage, one holding the instrument and keeping the patient's gaze in the right direction while the other makes the reading.

The instrument should be tested on the artificial metal cornea frequently, to be sure that the indicator arm registers accurately at zero on the scale. The instrument must be kept in perfect condition, so that the plunger glides easily.

Numerous observations seem to indicate that the normal limits of pressure seem to be between 15 mm. and 26 mm. on the Schiotz scale, but there may be individual cases where 28 mm. or even 30 mm. is normal.

PROBLEMS OF TREATMENT

Here we are confronted with difficulties that arise from our lack of definite, accurate knowledge of the etiology. Assuming the correctness of the statement of Fuchs that "genuine glaucoma develops only in an eye which has a predisposition to it," a dictum with which many will agree, the question naturally arises: What constitutes such a predisposition? If we knew exactly we should be on the way toward a rational prophylaxis. Lacking this definite knowledge we are forced to fall back on therapeutic measures that are largely empiric.

Most of these measures aim at combating some of the body conditions that are supposed to contribute to the development of glaucoma. In general they are reasonable for they include such measures as avoidance of excesses in diet and drink, avoidance of worry and hurry, prolonged hours of work and exhaustion, etc., etc., prescriptions that are not easily filled by many patients.

Few people realize the sagacity of the advice of the old medical philosopher that the best physicians to call in are Dr. Diet, Dr. Quiet and Dr. Merri-

man. As to our local therapeutic measures, they are all directed toward the main feature of the condition, the increased intraocular pressure, and are intended to facilitate and promote drainage from the eye.

We use myotics such as eserine and pilocarpine, and they have unquestionably shown their efficiency in a degree. The salicylate of eserine seems preferable to the sulphate, for it seems less irritating, and for continuous use in simple glaucoma, pilocarpine muriate or nitrate is to be preferred because of its less irritating effect on the iris.

The stretching of the iris resulting from the marked contraction of the sphincter muscle must draw the root of the iris away from the filtration angle and allow better circulation through that part. For the same reason the spaces of the iris are opened up and are supposed to be better able to absorb fluids from the anterior chamber.

One of the most important problems of treatment is that concerning operation, and particularly concerning operation on non-congestive or simple glaucoma. In congestive cases the evidence is clearer, for the accumulated experience of the masters in ophthalmology from Von Graefe down to those of present times speaks loudly in favor of operative means to counteract the increased intraocular pressure.

The debate waxes warm at times in regard to which method has the greatest value, and iridectomy still seems to have the best of it, but there seems to be little dissent from the view that some operative measure is necessary to bring about an artificial drainage.

It is different in the case of simple or non-congestive glaucoma. Here we have a condition that does not present the immediately dangerous features of the congestive type, and there are those

whose experience and skill are great who maintain the inefficiency of operation and rely upon the powers of myotics and general measures to maintain the proper pressure equilibrium.

How are we to direct our way in the midst of such disagreement? It seems to me that the study of our cases by means of the tonometer and the visual fields must furnish the guide. It may not be amiss to refer to my own rule of practice in such cases.

If the case can be controlled and general measures and regular applications of pilocarpine will keep the tension within normal limits, if the contraction of the fields does not continue, the central vision remaining normal, operation is not urged, but the patient is informed of the importance of regular observation of the case and religiously regular treatment. My observation is that cases that can be controlled in this way are few. If, in spite of general treatment and regular use of myotics, the records of the tonometer show increased tension at times, even if not great, and the fields slowly contract, or show enlarging scotomas, even if central vision is normal, operation is advised and urged, the patient, so far as his intelligence will permit, being made acquainted with the condition and its dangers.

As to the method of operation to be employed to accomplish this artificial drainage, the time at my disposal will not permit a discussion.

As in the past many roads led to Rome, so here many methods of operation properly performed have brought about the desired result and will do so again if proper conditions obtain and they are properly performed. The operations that have been proposed and championed for this deplorable condition are so numerous as to indicate that the perfect one has not yet been devised.

HEADACHES FROM THE STANDPOINT OF THE OPHTHALMOLOGIST*

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St. Paul

No symptom in medicine is more prevalent than headache and few there are, indeed, who at some time or other have not been victims of it. When viewed from an ophthalmological standpoint headaches due to eye strain must of necessity be differentiated from other types of headaches with which they are most readily confused, and it is this point that will be particularly emphasized. However, headaches due to more general causes such as diseases of the brain, digestive tract, kidney, blood vessels, acute and chronic infections, intoxications (chemical), constitutional diseases, etc., should never be lost sight of.

In the experience of the oculist, eye strain is the most frequent cause of headache. The complaint is probably due to the effort of accommodating in the presence of a refractive error or maintaining single vision where a muscular imbalance exists, thereby producing a neuro-muscular tension. The exciting cause may be hypermetropia, hypermetropic astigmatism or more rarely myopic astigmatism, esophoria, exophoria or hyperphoria. As a rule headaches of ocular origin are associated with the use of the eyes for near work, having their onset in the afternoon or evening, and are relieved by sleep or a period of rest. Nevertheless there are cases in which this symptom appears upon rising in the morning and becomes steadily worse throughout the day, especially where a muscular imbalance exists. Headaches due to eye strain are usually supraorbital or frontal, less commonly occipital or vertical. It has been the experience of some observers that, in a general way, headache in the frontal region is due to hypermetropia, in the temporal region to hypermetropic astigmatism and in the occipital region to muscular imbalance. So nice a selection can be justly challenged. The character of the pain is most frequently of a dull or boring nature and almost always bilateral and of equal intensity. In extreme cases even nausea and vomiting may be complained of.

A small degree of hypermetropia or hypermetropic astigmatism is physiological for the human

race and ordinarily gives rise to no symptoms. Even low degrees of muscular imbalance may be borne without discomfort. Nevertheless, the presence of a refractive error, however small, may, in certain individuals, be productive of the most annoying symptoms which, when optically corrected, are completely relieved. When a small refractive error or muscular imbalance produces eye strain there is always an additional etiological factor coupled with it, such as an unstable nervous system, lowered vitality from whatever cause or the excessive use of the eyes for near work. Such minor ocular derangements so frequently produce symptoms of eye strain in librarians, stenographers, bookkeepers, et cetera, that one might call it an occupational disease in this class of workers, due, no doubt, to prolonged reading, changing the gaze alternately from one near object to the other or faulty illumination.

There is a type of patient who, after a motor ride, shopping or moving picture entertainment, complains of pain in the eyes and base of the skull, the so-called "panorama headache." Usually, ophthalmological examination shows only a small degree of refractive error or muscular imbalance—more particularly the latter. In the opinion of the writer such cases are characterized by nervous instability.

Through medical inspection in public schools, much light has been thrown upon the causative factors in the production of apparent eye strain in children. The writer, during a service of seven years at the St. Paul Free Eye Dispensary, has retinoscoped 4,000 such cases, the usual complaint being difficulty with near work, e. g., frontal headache, epiphora, blurring of vision, burning, itching and smarting of the lids. No small number of these, upon a careful subjective examination, will be found to have normal vision for distance. When such is the case and the patients are refracted under a mydriatic (1 per cent atropin sulphate solution instilled into the eye three times a day for three days) many will show through retinoscopy but the smallest degree of refractive error. Neither will there be a muscular imbalance. It is plainly evident that the findings are out of all proportion to the ocular symptoms from which they complain. In most instances the cause lies in faulty hygiene, poor housing, poor or insufficient food or lack of sleep. If, in such cases, glasses are prescribed, they will be worn for a time through compulsion, novelty or imitation and will finally be cast aside. Some of these little patients are underweight and anemic,

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others scrofulous with hypertrophied tonsils and adenoids, enlarged cervical glands, follicular conjunctivitis, eczema, et cetera. The course of treatment to be pursued is self-evident.

Migraine headaches can usually be differentiated from those resulting from eye strain if sufficient history be taken. This malady affects women more frequently than men, in a proportion of about three to one. There is a marked hereditary tendency. In women it has its onset about the age of puberty and usually continues until after the menopause, pursuing its course in the form of paroxysmal attacks at regular intervals. Such is the general rule which finds many exceptions. The attacks may occur weekly, fortnightly or monthly and are very commonly present at the time of menstruation. Generally, the headache at first involves but one side of the head, usually the forehead or occiput, gradually extending over the whole calvarium. The pain is of a throbbing or binding nature and may be accompanied by sparkling light before the eyes which increases in extent until finally the patient is temporarily blind (scintillating scotoma). During these attacks the patient may complain that he sees only a portion of an object, the right or left, upper or lower half (hemianopia). Dizziness, nausea and vomiting are commonly present. Such a seizure lasts usually from six to twelve hours, sometimes longer, even for two or three days.

All gradations of the above clinical picture may occur. It is usually the atypical case who consults the oculist, with the hope that by a proper fitting of glasses headaches will cease. If, in such a case, the headache displays a hereditary tendency and periodicity over a considerable length of time and without particular reference to the use of the eyes for close work, the condition can be stamped as migraine. Minor errors of refraction should be corrected and in a few cases will prove helpful. That such a remedial measure will abolish an attack of migraine would be asking too much.

A condition allied to migraine headache is that associated with nervous asthenopia (copiopia hysterica). The condition differs from migraine in that the symptoms are a daily occurrence and are not subject to periodic attacks. Reading, even for a very short period of time, so fatigues accommodation that headache and blurred vision result and work must be set aside. Usually, it is only upon using the eyes for close work that the ocular symptoms become manifest. There are cases, however,

in which the headache begins in the morning upon rising and is aggravated by reading. There may even be a sensitiveness of the eyes to light. Nervous asthenopia is frequently a symptom in women during the menopause. A diagnosis of nervous asthenopia can only be made in the absence of a refractive error or muscular imbalance proportionate to the degree of ocular symptoms present. Correction of minor errors of refraction will prove of no benefit in this condition.

Quite commonly hysterical and neurasthenic patients refer their headache to eye strain. As clinical entities, these conditions are so closely allied from an ophthalmological standpoint, that their symptomatology may be spoken of collectively. All gradations and combinations of the following ocular phenomena may be present; headache, muscular imbalance, poor visual memory, limitation of the visual field, imperfect accommodation, drooping of the lids, irregular or hyperactive pupils, temporary obscuration of vision, optical hallucinations, limitation of the color and light sense. While it is true that the exhaustion field is characteristic for neurasthenia, it sometimes occurs in hysteria. In this class of cases, the headache is more a sense of pressure, weight or fullness and, while it may be frontal or occipital in location, is frequently referred to the vertex. Tenderness of the scalp is not uncommonly associated with it. Optical correction of existing minor errors of refraction or measures for the relief of low degrees of muscular imbalance may prove helpful, but are rarely adequate.

An affection not infrequently mistaken for headache of ocular origin is the so-called vacuum headache, a condition established as a clinical entity by Sluder* and Ewing.* This malady is described by Sluder as "a low grade unending headache" brought about through the closure of the frontal sinus without nasal symptoms or signs (e. g. obstruction or secretion) and made worse by use of the eyes. The pain experienced is due to a partial absorption of the air contained within the sinus, with a resulting negative pressure rendering the walls sensitive. The headache though frontal is occasionally referred to the external angular process of the frontal bone. This type of headache is characteristically present in the morning, becoming worse with the use of the eyes for near work. However, there are cases where headaches are only precipitated by the use of the

*Trans. Am. Ophth. Soc., 1900.

eyes for near work. Unlike headaches due to eye strain, and which are generally a daily occurrence, vacuum headaches characteristically appear at irregular intervals and may disappear as suddenly as they appear. Just as in empyema of the frontal sinus, this type of headache is increased on stooping and often attended by a sense of dizziness. Ewing's sign, "tenderness of the upper, inner angle of the orbit at the point of attachment of the pulley of the superior oblique muscle and internal and external to it" is pathognomonic of the condition. As the function of this muscle is to turn the eye downward and inward, it is called into play during the act of accommodation, necessitating a tugging at the tender point. The tenderness of this area is explained by Sluder "as arising from a closure of the outlet of the frontal sinus thereby producing a negative pressure through absorption of the oxygen therein contained with a resulting congestion of the lining membrane together with the underlying bone." Tenderness of the eyeball to backward pressure, a clinical sign to which but little attention has been given, is almost always present. The nasal conditions that may give rise to vacuum headache Sluder groups into the following classes: (1) when there exists an enlargement or tilting of the septum tubercle out of the midline in a normal or particularly narrow nose; (2) narrowing or occlusion of the hiatus semilunaris through anatomical variation so that the uncinate process and bulla are in contact; (3) edema of the vault of the middle meatus; (4) anatomical insufficiency of the vault; (5) middle turbinate hypertrophy; (6) empyemas or coryzas that have gotten well but have left a degree of swelling in the vault of the middle meatus sufficient to keep the frontal sinus closed.

In view of the fact that this malady has a nasal origin, generally without a demonstrable gross anatomical or pathological change, it is difficult at times to convince oneself that this is the proper diagnosis in a given case even when there is present Ewing's sign, a tender eyeball and a history of periodic attacks. Fortunately, vacuum headaches lend themselves readily to a reliable therapeutic test. If a patient appears during an attack of headache it is the writer's custom for diagnostic purpose to place a pledget saturated with 1-1,000 adrenalin or an astringent beneath the middle turbinate for a few moments. If after a short time the headache disappears, or is diminished in its

intensity, it is strong presumptive evidence that this symptom is due to insufficiency or lack of aeration of the frontal sinus. Treatment consists of applications of astringents to the region of the nasofrontal duct and when this appears inefficient or inappropriate, surgical procedure for the purpose of removing pathological or purely obstructive tissues.

From a differential diagnostic standpoint headaches due to eye strain will not be contrasted with those arising from empyemas or hyperplastic conditions of the paranasal sinuses. It is enough to say that so intimate is the anatomical relationship between the eyeball and the accessory sinuses that an examination of the former should be accompanied by a routine examination of the latter. If this is carried out, usually enough pathological evidence will be found within the nose to stamp a headache arising from this source.

Neuralgic phenomena, the expression of nasal (sphenopalatine) neurosis, offer a symptom complex too involving to be confounded with pain associated with eye strain.

The types of headaches ordinarily mistaken for those arising from eye strain have now been mentioned. To elaborate further would only prolong the paper to undue length. Speaking in general it is imperative for the proper estimation of optical error that the patient be refracted under a mydriatic, atropine in children, homatropine in the adult. It should ever be kept in mind that the retinoscopic finding, in the final analysis, is but a guide, the trial case the court of last appeal. A good refractionist is one possessing the following requisites: knowledge, accuracy, experience, judgment. Minor errors of refraction, those within physiological limits which apparently give rise to eye strain, should be fully corrected. But before this remedial measure is applied the case should be studied from a differential diagnostic standpoint. Is the headache really due to eye strain?

DISCUSSION

DR. JOHN FULTON, Saint Paul: I have had the privilege and pleasure of working with Dr. Berrisford for the past four years at the Saint Paul Free Dispensary, and I am familiar with the painstaking care and the absolute accuracy with which the refractive work is done. I read his paper a few days ago. He has added many important points to it since. Dr. Berrisford has given us a very excellent presentation of this very important branch of ophthalmology.

The percentage of eye cases coming before us suffering with headaches on account of eye difficulties is variously

estimated by different authors. Hogue, of Milwaukee, affirms that 50 per cent of headaches are due to eye strain. De Schweinitz, one of our most conservative and best known oculists, estimates that 70 per cent of all functional headaches are caused by eye strain.

The best definition of ocular headache that has been given is as follows: "An acute discomfort in and about the head that directly or indirectly results from organic or functional disorder of the visual apparatus."

The pain is usually frontal or occipital, but it may radiate to many other places: between the shoulders, in the precordia and deep in the mastoid.

The degree of refractive error has nothing to do with the amount of discomfort produced. In fact, the lower degrees seem to produce the most trouble. The same remark also applies to muscular insufficiencies.

So when the question is asked, what degree of ocular or muscular trouble should be corrected, my answer is: any degree that gives rise to severe symptoms that interferes with the patient's work and cannot be relieved by local and constitutional remedies.

The author of the paper has referred to migraine. I agree with Wilder in saying that this trouble is not of ocular origin, but seems to bear a relationship with the function of the pituitary body. Some of the best known English oculists claim that they have given great relief to the unfortunate persons who suffer from this malady by the internal administration of the whole of the pituitary gland as prepared by Armour.

The question naturally arises, how does eye strain produce headache? I heartily agree with Dunn and Ellis in thinking it is produced by increase of intracranial pressure. In a recent paper published by Dunn in the Archives of Ophthalmology, March, 1918, he enters into a prolonged explanation as to how this pressure is produced, but on account of the brief time allotted to us, it cannot be entered into here.

Jackson has called our attention to a class of patients suffering from pulmonary tuberculosis with lesion of considerable extent, but with great systemic resistance, who suffer with the most annoying asthenopia and ocular headaches, the correction of which gives the patient **marked** relief, but never complete until the lung trouble is completely healed. In many of these cases they are able to discard the glasses after complete convalescence from the tuberculous trouble.

The moving pictures are often accused of producing severe eye symptoms and headache. I am convinced that this never takes place to normal eyes. In fact, I am in the habit of telling my patients, after they have been refracted, to go and try the movies, and if they find their eyes are perfectly comfortable, I know their refractive trouble has been properly corrected.

A form of asthenopia, which is much neglected and too frequently looked upon as hysteria, is retinal asthenopia. In other words, this is an irritable retina. All bright lights are very annoying to the patient; they have distressing after-images and various kinds of color scotomata. Very great relief can be obtained for this trouble by the liberal use of adrenalin, both before and after refractive and muscular correction. Ocular headaches are due to fatigue. The most common exciting cause is long, continued use of accommodation and convergence in near work. The underlying ocular condition that brings this about is hyperopic astigmatism, associated with heterophoria.

The instinctive desire of everyone having refractive and muscular errors to maintain single binocular vision and normal clearness of sight is also a great factor in producing headache. People with one eye or those with one eye so defective that fusion of images is impossible, rarely have this form of trouble.

DR. JOHN FULTON, Saint Paul: I see we have Dr. Collins here from Duluth, one of the oldest and most experienced oculists. I think we would all like to hear from him.

DR. HOMER COLLINS, Duluth: I want to say that my experience has been in exact accord with Dr. Berrisford's, and I think he has covered the subject thoroughly. I really have nothing to add. The vacuum headaches we do come across occasionally, and often—as Dr. Berrisford says—they are more apt to be confusing because the nose shows so little abnormality. The only way I have ever found for testing was exactly the method he has used, shrinking the nasal mucous membrane, and then the relief was almost instantaneous.

DR. BERRISFORD, St. Paul (closing): I wish to express to Dr. Fulton my sincere gratitude for the prominence he has given my paper by discussing it. His well known skill and wealth of experience gives to his remarks the utmost importance.

One portion of the paper I wish especially to emphasize: "vacuum headache" is a clear-cut and distinct clinical entity. It is difficult, at times, to convince oneself that this ailment is of nasal origin in view of the fact that upon rhinological examination the nose shows little if anything that might account for the symptoms manifested. However, the presence of a tender eyeball, tenderness at the upper inner angle of the orbit described by Ewing, and a history of periodic attacks are facts which very strongly suggest this diagnosis. If, during such an attack symptoms are rendered less severe or wholly disappear as the result of the therapeutic test already described, a diagnosis of "vacuum headache," the result of improper aeration of the frontal sinus, is justifiable.

BRONCHIAL ASTHMA*

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Asthma is a term which has been more or less loosely applied to conditions having dyspnea as a pronounced symptom. What has been learned during the past decade points to hypersensitiveness as the basic cause of asthma, so we shall restrict ourselves to bronchial asthma—a condition resulting from allergic reaction.

The vast amount of work done in the past ten years has done much to place the treatment of this disease on a satisfactory basis and permit it to be classed as a curable disease. Nothing new is being offered at this time because what is needed is a better comprehension of the facts already known, instead of piling up more. We are crushed and suffocated with dry, single facts. I agree with Van Rijnbert, the editor of *Tijdschrift*, who says, "What a blessing it would be if all the journals of the world would agree not to publish any new facts for ten years and devote their pages to collective reviews and monographs on the facts already known."

After being successful in treating a few cases of bronchial asthma, I felt very proud of my knowledge, but as the number of patients I saw increased, my pride decreased and now I am very humble.

A neurotic family history, epilepsy, hysteria, hay-fever and eczema are frequently connected with bronchial asthma. Anaphylaxis is especially apt to occur.

Asthma commonly commences during the first decade, but may begin at any age. Unless relieved, it persists to old age.

The exciting causes of a paroxysm are of great variety. Conditions of climate and atmosphere; emanations from leaves, flowers or animals; various dusts; food proteins; bacterial products; chemical substances, nasal polypi and emotions and nervous disturbances are some of them. What may be a cause today may not be a cause at a later date. A complicating bronchitis may become a cause. Since there are such a large number of causes of asthma it is frequently, and at times impossible, to detect the cause.

The mode of onset of asthma, or the symptoms preceding the initial attack of asthma, has little bearing upon the cause, since, in the majority of

cases, the onset is preceded with what the patient calls "a cold" or "bronchitis."

The time of year in which an attack of asthma begins and the season of the year, if it always limits the attack of asthma, are important. Attacks during the summer months are usually caused by the protein in the pollen of plants. In many instances this summer type of pollen asthma is prolonged throughout the year by bacteria. In those who have had asthma for a considerable length of time there may be bronchitis and emphysema, so that the removal of the offending cause must be followed by treatment of the bronchitis, if we are to get relief.

When a person is sensitive to a specific substance certain symptoms are produced by that substance when taken into the body. Proteins are widely distributed in nature and it is the protein in the substance which causes asthma. Proteins enter the body by ingestion, as in foods; by inhalation, as in pollens, dust and dander; by absorption through the skin and mucous membranes; by infection, from pathologic bacteria in teeth, tonsils, nose, throat and lungs; and by injection with horse serum. In the case of bacteria we have to deal with the protein element as it is the protein element only which makes a positive skin test. A negative test does not rule out a particular bacterium as a cause, since the infectious element of the bacteria may cause the asthma.

The attacks are frequently during the night, after a few hours of sleep. The onset is fairly sudden with premonitory symptoms of oppression in the chest and may be accompanied by sneezing, flatulence, polyuria and great depression. During the paroxysm the respirations are slow with short inspirations and long, wheezy expirations. There are strong contractions of the accessory respiratory muscles. The patient is pale or cyanotic and anxious. There is cold perspiration on the skin. There may be paroxysms of coughing until a viscid sputum is raised. Then relief follows. An attack may last from a few minutes to a few hours. The patient sits, leaning forward, and may grip something to reinforce the chest muscles. The thorax is fixed in the expanded position. On percussion there is hyperresonance and on auscultation numerous musical râles and noises may be heard.

The sputum contains small gelatinous masses, being spirally twisted casts of the small bronchi. Often numerous eosinophiles are embedded in

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them. These masses, or "Curschmann's Spirals," are quite diagnostic of true asthma, but are usually absent in old cases with emphysema. An eosinophilia of from 5 to 30 per cent may be present in the blood. Only in bronchial asthma do a blood and sputa eosinophilia occur simultaneously. Eosinophilia is regarded as one of the chief clinical and pathologic symptoms of allergy.

When there have been several severe and prolonged attacks, more or less emphysema develops. One would expect some cardiac hypertrophy in cases of long standing, but hypertrophy is not always present.

Huber and Koessler,¹ in their microscopic study of the lungs of sixteen cases of the bacterial type of bronchial asthma, found hypertrophy of the bronchial musculature (4 cases); cellular infiltration (3); eosinophiles (3); thickened bronchial arteries (2); extensive cellular infiltration of the bronchial mucous glands (2); atrophy of the bronchial glands (1); calcified and ossified bronchial cartilages (2); occlusion of bronchioles (2).

In making a study of a patient having symptoms of asthma we follow a definite routine as far as it is practicable or possible. The routine is followed both in private practice and at the Minneapolis General Hospital. This is of necessity if we are not to overlook some important finding. Besides, it is good practice.

1. A complete history is taken and recorded, giving special attention to age at onset of symptoms; seasons when symptoms begin or are worse; place where attack began; what makes it worse; what gives relief; whether occupation is a factor and all circumstances associated with the first attack.

2. Complete physical examination, including a diligent search for foci of infection.

3. Examination of sputum and nasal secretions.

4. Complete blood examination.

5. Wassermann of the blood.

6. Urinalysis (24-hour specimen).

7. Basal metabolism estimation.

8. Skin tests to the proteins in food, pollen, animal hair and dander, bacteria, et cetera.

9. Roentgen ray of lungs, heart, paranasal sinuses and teeth.

10. Nose and throat examination.

11. Complete dental examination.

12. Tuberculin test.

13. Other special examinations when indicated.

SENSITIZATION

The subject of sensitization is relatively new and comparatively few realize its importance and the amount of study that it has received in the past few years. Various terms are used to express sensitization. The commoner ones are "hypersensitiveness," "allergy," and "anaphylaxis." Anaphylaxis was discovered in 1902 by Richet. He called it "anaphylaxis" because he incorrectly thought it was opposed to "prophylaxis." Eight years later Meltzer noted the similarity of the bronchial obstruction of asthma and that found in animals dying in anaphylactic shock.

Active Sensitization.—As far as we know, sensitization is caused by the protein element in a substance. Proteins are widely distributed in nature and are present sometimes where we least expect to find them. As they concern us, they are present in food, animal dander and hair, house dust, bacteria, pollens, face powders, sachets and drugs.

We are beginning to recognize that there are different kinds of sensitization. Pinness² observes that anaphylaxis is an induced and experimental hypersensitiveness in animals; it is rare in human beings; while allergy is a natural, inherited hypersensitiveness affecting only human beings. The hypersensitive state may be present at birth, inherited or conveyed by mother to child.

The body cells produce specific antibodies following the injection of protein. After a certain time antibodies are produced in such quantities that, upon re-introduction of the same protein, certain symptoms follow. These symptoms are generally called "anaphylactic shock."

Example.—If you inject a guinea pig with 1 c.c. of horse serum, no symptoms are observed. If you inject .01 c.c. of serum daily for twelve days and then inject 1 c.c., no symptoms are produced. If you wait twelve months and then inject 1 c.c. of serum, you will get anaphylactic death. (The pig was previously immunized and has returned to the sensitive state.) If you inject a guinea pig with .01 c.c. of serum and in fifteen days inject 1 c.c. of the same serum you will get anaphylactic death. If you inject .01 c.c. of serum and in twelve days inject a sublethal dose you may get symptoms, but not death; then you may give several c.c. of serum without symptoms. The sublethal dose has, for the time being, desensitized the animal. It has united with the antibodies and taken them away from the cells. The antibodies are not now attached

to the cells. After a time the antibodies will become attached to the cells and then the union of antigen (protein) to them will produce symptoms. A guinea pig may be sensitized by an amount as small as 0.000001 c.c. of serum.

When antibodies are few and attached to the cells we have the sensitized state. When they are in excess we have the immune state.

In the guinea pig death results from the contraction of the smooth muscles in the bronchi.

Passive Sensitization.—If you take serum from an animal that has been actively sensitized and inject it into a normal animal and wait for two days you will find that the second animal is sensitized to the same protein as was used to desensitize the first animal. This transfer of immune bodies from one animal to another, by means of serum, is an example of passive sensitization.

It is possible to sensitize human beings in this artificial way to a foreign protein, but, unlike the guinea pig, they do not of necessity remain permanently sensitized. In a number of clinical conditions sensitization has occurred, not through any known artificial way, but in an unknown natural way. In this group are hay-fever, bronchial asthma, angioneurotic edema, and acute gastro-enteritis. These are examples of allergy.

When a definite type of cells are sensitized we get a group of symptoms depending upon the character of the cells. If the smooth muscle fibers in the bronchi are sensitized, together with the mucous membrane cells in the bronchial tree, we have the symptoms of bronchial asthma. When the mucous membrane of the eye, nose and throat is sensitized, we have the symptoms of hay-fever; when the cells of the gastro-intestinal tract are sensitized, we have gastro-enteritis; when of the skin, we have urticaria, and when of the connective tissue, we have angioneurotic edema.

Coca gives the following differences between anaphylaxis and allergy:

1. The exciting agent of anaphylaxis is always antigenic in character. The exciting agent of allergy may or may not be an antigenic substance. (For example: it may be a drug such as arsphenamin or acetylsalicylic acid.)
2. Although anaphylaxis may be transmitted from mother to offspring, it is not inheritable in the true sense of the word. It is always, primarily, an artificial condition induced by

the introduction of antigenic substance into the body of some susceptible animal.

Allergy, on the other hand, is always based, primarily, on a natural inherited makeup. The sensitiveness classed as allergy does not in every instance appear to depend on previous contact with an exciting substance. An individual, for example, may have a violent allergic reaction when he comes in contact with the exciting substance apparently for the first time.

3. The phenomenon of desensitization, which can quickly and invariably be brought about in animals with anaphylactic sensitiveness, is entirely wanting in allergy. The state of reduced sensitiveness observed clinically, after treatment of allergy by hypodermic injections of the exciting agent, is never complete nor is it comparable with the above.

Human beings who have become sensitive to some protein are far more sensitive than animals that have been sensitized by injecting foreign protein. For example: It takes relatively more foreign protein with animals, which have been sensitized, to produce marked symptoms than is required in a sensitive human being.

The time of the occurrence of symptoms varies in human beings. It varies from a few seconds to several hours. A patient may be sensitive to a protein at one time and only mildly sensitive a week later, or he may not be sensitive at all. It has been shown that, when an animal is sensitized to three antigens, desensitization to all three might be effected by using only one of the antigens.

The important clinical manifestations of sensitization are: (1) allergy and anaphylaxis; (2) the immune reaction to smallpox vaccine; (3) the tuberculin reaction; and (4) serum sickness.

In serum sickness the symptoms appear from the first to the fifteenth day after injection. The symptoms are late after an initial injection, but after a second injection they usually occur in from three to six days with more marked local and general reaction, and edema and urticaria may be present in twenty-four hours. A reaction consists of a rash which is very itchy and may be accompanied by painful swollen joints, adenitis, albuminuria and fever.

THE SKIN TEST

One of the most practical ways of discerning whether a patient is sensitive or not is by means

of the skin test. Von Pirquet's test with tuberculin "O.T." is the basis for all tests of this kind. A positive reaction consists of a distinct urticarial wheal surrounded by a zone of erythema in the presence of a negative control test. A true reaction is always indicated by a wheal having an irregular outline.

The skin test should not be relied upon entirely, and its results should be used only as a clue. I will mention some of the reasons for this statement. There are occasional transitory periods during which a patient may not react cutaneously to a protein to which he is sensitive. This makes it necessary to make repeated tests in suspected cases. About 50 per cent of the people who are sensitized at all show multiple sensitization and a patient, at the time of the test, may be temporarily desensitized to one or more of the proteins being used and will be cutaneously negative to that protein, although he reacts positively to some other protein. One should not allow a negative skin reaction to rule out a protein which is strongly suspected. One may also get a positive reaction, due to the fact that the cutaneous cells are sensitized, even though they are not involved directly in the clinical type of the disease.

Besides testing with proteins from the usual foods, pollens and animal emanations, one frequently must suspect unusual sources of protein such as street dust, house dust (including that from wall paper), wall hangings, glue, boxwood, face and tooth powders, woolen and grass rugs, pillows, mattresses, felt hats and many others. When the skin tests fail to give any definite information it may be necessary to try some of the suspected substances on the patient, always remembering that ingested food or inhaled dust may not produce symptoms until six or eight hours have elapsed.

ASTHMA IN CHILDREN

Ratner³ calls our attention to the fact that many physicians still labor under the impression that very young infants do not suffer from asthma. He states that recurrent attacks of hypernea or dyspnea, without a rise in temperature and with the lungs containing sibilant and sonorous râles which gradually clear up in twenty-four to seventy-two hours, should be looked upon as asthma, no matter how young the infant; and that the cessation of râles, after the injection of adrenalin or atropin, will prove the diagnosis.

Abt⁴ states that, clinically, we may recognize two main varieties: (1) cases associated with bronchitis, and (2) cases characterized by sudden onset with a tendency to periodic recurrences. The first form begins with marked bronchitis, fever, lassitude, rhinitis, restlessness and even delirium. Anorexia and vomiting may occur. Respirations may be fifty or eighty per minute. The breathing is loud and noisy. There is an immobile appearance of the chest during expiration. Numerous dry, whistling, sibilant râles are heard. The cough is disturbing. The second type of asthma, as it occurs in children, resembles in many respects the asthma of adults. As a rule, children who have apparently been in normal health are suddenly attacked with severe dyspnea shortly after retiring. The chief trouble is expiratory. The lungs are hyperresonant. Loud, whistling and sibilant râles are heard. The attack usually disappears suddenly.

We must be careful to differentiate asthma from diphtheria, acute laryngitis, whooping cough, retropharyngeal abscess, enlarged bronchial glands, enlarged thymus, congenital stridor, foreign bodies in larynx or trachea and ulcer of the larynx.

The common sources of foreign protein in infants' food are milk and egg. Shannon and O'Keefe have shown that infants may be sensitized to foreign protein by the passage of these proteins through the mother's milk; while Hermann has reported that pollens may pass through cows' milk and that individuals, who are sensitive to pollen, will have symptoms on taking this milk. It is frequently observed that a case sensitive to egg will get no reaction if the egg has been well cooked, and that a case sensitive to milk will frequently be able to take boiled milk without symptoms.

TREATMENT

The treatment of asthma is the treatment of the cause. A careful history is the most important part of the study to bring out the cause. Each patient with asthma presents a definite problem for solution. Practically no two cases are alike, and this fact makes it difficult to give any classification of treatment and, perhaps, explains why one form of treatment gives results in one case and not in another having, apparently, the same cause.

First, all foci of infection should be properly treated, as some patients have an attack of asthma as a result of a focus of infection rather than an arthritis or an attack of neuralgia. A few cases have been reported where the patients had an at-

tack of fever of obscure origin followed by an improvement in their asthmatic condition. This suggests that the successful treatment of asthma may, in certain cases, be sought in the factors causing or associated with fever.

I saw a patient three years ago suffering from very severe asthma. Before any relief was obtained she went to Florida and then to California and, after getting the advice of several physicians and trying various remedies, finally came home in disgust. A short time after her return home her asthma suddenly left her and she has had complete freedom for over two years. This appears to be a spontaneous cure.

If the food group of proteins is the cause, the foods containing them should be completely avoided for at least four or five months. If this is impracticable, the patient should be desensitized against the offending protein. Desensitization, unfortunately, lasts only a few months.

If asthma is due to the pollen group, the patient should receive subcutaneous injections of pollen antigen beginning fourteen weeks prior to the expected date of attack.

If asthma is due to epidermal dust or to hair, the patient may be desensitized, but it is better to keep him away from the source of the offending substance.

If asthma is due to orris root or drugs, these should be avoided. If due to house dust, desensitization or a change of climate would be indicated. As a general rule some benefit may be obtained by some supervision of the patient's mode of living. The diet should be low in animal protein, patient should have a short period in bed to improve the digestion, and a change of climate may be of value. Discipline is essential, as many asthmatics have strong neurotic tendencies.

Good results have been reported in a few instances by the use of non-specific proteins such as typhoid vaccine, defibrinated blood from the patient and also injections of peptone. Many asthmatics show a great sensitivity to tuberculin. Tuberculin, in many instances, exerts a beneficial effect upon them. Tuberculin therapy should be cautiously tried where a specific agent, coming from without, cannot be determined. Tuberculin therapy may be of use as an auxiliary to specific protein therapy. Give 1 c.c. of a 1 to 100000 dilution of Koch's O.T. on alternate days. Increase dose after

a few days, but avoid reactions. Too large a dose may cause a severe attack of asthma.

A certain number of patients have a chronic bronchitis accompanying the asthma. In these cases treatment of the bronchitis should be added to whatever other treatment they are receiving. A vaccine made from the predominating organisms in the sputum offers very good results in about 50 per cent of these so-called bacterial asthmatics. To get the best results in this type, the vaccine must be made by a competent serologist and administered by one who understands vaccine therapy. The permanency of relief depends upon the amount of treatment and the patient's power of resistance. Vaccines are successful only in case some local reaction at the place of injection follows the subcutaneous dose. The usual initial dose is 100 million, rapidly increased every fifth or sixth day until local reaction occurs, or until five or six injections have been given without local reaction. Vaccines produce only active immunity. They should be used with great care in the presence of acute infection. Their greatest use is in the recurrent type of asthma where, by producing a degree of active immunity, the hope of modifying the next attack is reasonable.

The following cases are reported because of the apparent specific action of the vaccine used.

CASE REPORTS

No. 8213 (M). Widow, aged 60. Always quite well until September, 1920, when she developed bronchitis and asthma. In bed thirteen weeks. In January, 1921, her physician did an extensive nasal operation, thinking it would help the asthma. Asthma and cough disappeared two days after the operation, but returned in five weeks. On Feb. 1, 1921, she had a second nasal operation without any good effects, and asthma continued. She consulted me in August, 1921, asking for enough relief so that she might get along without a nurse. She had difficult breathing in attacks lasting from one to several hours at a time, worse at night. There was a productive cough; circulatory, digestive and urinary systems appeared normal. Tonsils and all doubtful teeth were removed six months previously. Lungs were slightly emphysematous, with prolonged expiratory murmurs, accompanied by numerous and various types of musical râles. She was negative to various skin tests. A vaccine obtained from her sputum was given her and at the end of three weeks she was completely relieved. One month later she sat for a half hour with her feet in cold plaster of paris and two days later she was having severe bronchitis and asthma, with a temperature of 102. A vaccine was prepared and given her and she again had complete relief. Again, on Jan. 1, 1922, she rode in a cold street car and soon had severe bronchial asthma, which was cleared up after six injections of autogenous vaccine. She is at present having no difficulty.

No. 8076 (G). Previous history negative. On Sept. 26, 1920, patient developed a severe attack of urticaria, two days after eating barracuda (deep-sea fish). Since then red meats, ice cream or chocolate aggravate the urticaria. On examination, all organs appeared normal. Skin had some large areas of urticaria. Complete blood examinations, including Wassermann, were normal. Roentgen ray of the gastro-intestinal tract showed ileo-stasis, otherwise negative. The urine was negative. One year later she developed bronchitis with difficult breathing, followed in two days by urticaria and numerous musical râles in both lungs. The usual skin tests were negative, except for the streptococcus hemolyticus, non-hemolyticus and viridans, which were slightly positive. An autogenous vaccine was made from the sputum. One c.c. of a vaccine containing streptococcus 50 M to c.c. and gram positive diplococcus 200 M to c.c. was given, and two days later she had a severe attack of urticaria. Then she was given 0.00005 of a c.c. and, two days later, had slight urticaria, and on trying different dilutions it was found that 0.0000001 c.c. did not produce urticaria. This was increased to 0.00005 c.c. without urticaria. Then she developed sudden rise of temperature to 104 and general aching, with some soreness in the breast, followed, in twenty-four hours, by the worst attack of urticaria she had ever had. These symptoms subsided in about three days and returned in two weeks, with similar results. There did not seem to be fluctuation in the breast but, because of the history, it was opened about ten days later and two ounces of pus obtained. A culture from this pus gave a pure growth of large gram plus diplococcus, the same as was found in the sputum. The patient has had no asthma or urticaria for the past two years.

CONCLUSIONS

A careful history often gives the clue to a correct diagnosis. Such a history, a complete physical examination, and properly interpreted skin tests, are the three essentials in the diagnosis.

Bronchial asthma may have widely different etiologic factors. It is frequently a complication of, or augmented by, pathologic agents.

The symptoms in infants may be unlike those in adults.

Asthma may now be regarded as a curable disease.

The treatment may vary greatly in different individuals. It depends entirely upon the cause of the asthma.

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DISCUSSION

DR. C. N. HENSEL, St. Paul: The fundamental principles underlying the diagnosis and the treatment of bronchial asthma on the basis of protein sensitization, are pretty well established. These principles have been adequately presented by Dr. Lajoie and so, in discussing his paper, we need only emphasize certain points. First protein sensitization is not a cure-all, but is a means by which we can make differential diagnoses in cases of bronchial asthma, between the conditions in which the patient is sensitive to foreign proteins causing his asthma, and conditions in which he is not sensitive.

We must recognize that the skin tests are absolutely specific, and if we are guided by the skin tests we have an index to treatment. We must remember that in cases of asthma coming on in the early years of life, even up to thirty-five years of age, in a large proportion of the cases (upwards of ninety per cent), foreign proteins are the cause. You get a positive skin test, and following along the lines of that positive skin test you get relief in treatment. From thirty-five to forty-five years you have a larger proportion of cases that are not sensitive. In cases beginning with bronchial asthma after forty-five very few show positive skin tests, and therefore the specific line of treatment is not indicated.

If we bear these two facts in mind, namely, that the cases with onset in early life are the protein positive cases and the cases with onset in later life are the protein negative cases, then we have two general guides for treatment. In the young the foods play a prominent part, animal emanations another prominent part, plant pollens causing less disturbance. In older people the conditions are much more likely to be cardio-renal disease, associated with hypertension and chronic sinus disease. I personally have had very little success in the removal of tonsils in these cases of asthma in middle life, but I have found a great deal of success in having these cases examined by a careful nose and throat specialist with reference to the middle and superior turbinates and with reference to ethmoid infection and nasal polypus.

The case that Dr. Lajoie described apparently has a sinus infection of low grade. Perhaps pus is not directly demonstrable, but there is a stringy, glairy, viscid mucus. Those cases light up asthma due to any chilling as the doctor has described. These are the cases where adequate nasal treatment relieving nasal pressure give a great deal of relief.

And finally, in the adult non-sensitive type of cases, as Dr. Lajoie has said, autogenous vaccines are found helpful. Sometimes your laboratory will report two organisms which show equal growth. Vaccines should be made of both strains, testing the patient with both, and using the strain finally which gives you the local reaction at the site of the inoculation.

In conclusion, do not denounce the skin test because you do not always get a positive reaction.

You cannot expect positive reactions in more than 60 per cent of all your cases, certainly a sufficient percentage to make it worth while.

DR. C. B. WRIGHT, Minneapolis: I feel, with Dr. Lajoie, very humble in discussing this subject because my personal experiences have not been so brilliant as the literature which I have read. There are a number of things, I think, in the discussion of this subject which are of great interest. First, one will, of course, be successful in the treatment of these cases in direct proportion to the amount of thoroughness and care with which he studies each individual case. Since the use of the desensitization test I think there has been somewhat of a tendency on the part of men working on this subject not to study as carefully as they should the clinical findings on the patient himself and to assume that because he is sensitive to certain proteins he must have true bronchial asthma and on that basis one is, of course, apt to fail.

In order to prove, it seems to me, that the offending protein is the cause of this disease, one should not only be able to get sensitization of the skin but he should also be able to cure the patient by the removal of this protein. Without that therapeutic test I think our conclusions are entirely groundless. The greatest difficulty we have in the differential diagnosis of asthma is with the older patients. In cases that start in patients over fifty years of age it is usually not true bronchial asthma but it is chronic bronchitis.

This is the field in which the proprietary medicine has officiated for years, and I believe we have a remedy made in St. Paul on the basis of our good friends, stramonium leaves and saltpeter, and it is a very valuable thing in relieving acute attacks. In addition to that, the other antispasmodics are used in this type of case. The very old patients present a difficult proposition. Once in a while a vaccine will do them some good, but my experience is not so entirely satisfactory as the literature would lead me to believe.

The whole subject is a large one. Then there are so many ramifications, so many different types of cases that later get attacks of dyspnea or asthmatic attacks that the whole situation depends, first, in my opinion, on the thoroughness with which these cases are worked up and, secondly, on the co-operation of your patient; that, in my opinion, is the most difficult thing of all. In the young, where our results should appear most favorable, if we get these cases they are the most difficult people to co-operate with. They come in for immediate relief and you only see them again when they come back for relief again. The older patient will always co-operate but unfortunately that is the type of case in which we get very much less brilliant results.

DR. JOHN M. LAJOIE (closing): I have nothing further to add except to bring to your attention a few points. We always try to get the co-operation of the patient and make a thorough physical examination in an attempt to locate any foci of infection and, if the patient is under forty-five or fifty, make thorough skin tests with various proteins. It sometimes happens that an asthmatic consults a physician and, because he has asthma, nothing much is done for him. A prescription will probably be given him with the hope that it may help him. I have seen a few patients who have had this kind of treatment. I believe that with good, hard work, coupled with a vivid imagination, we will be more successful in the future than we have ever been in the past in discovering the cause of bronchial asthma in a given case.

DON'T WORRY IF YOU CAN'T SLEEP NIGHTS

To make a business of sleep is a bad habit. That is what persons do who worry because they can't sleep.

In answering a question about insomnia, *HYGEIA*, the popular health magazine, in its April issue declares that the chief harmful effects from not sleeping are caused not by sleeplessness, but by worry over not sleeping.

Sleep should and will come naturally, if one will only realize that it is rest and not sleep that is needed, says the health journal.

Of course it is important to pay attention to the ordinary

rules of hygiene, with regard to exercise, fresh air and reasonable diet. But, above all, it is important to fill one's life with satisfactory work and play.

The best incentive to sleep is still the feeling of "something attempted, something done," particularly something to help others.

As to the amount of sleep needed by different persons, that varies within wide limits and is much modified by habit. Many energetic, active individuals get along quite well with four or five hours of sleep. The proper amount for the average adult, however, is usually between seven and eight hours.

DIAGNOSIS OF ANOMALOUS RENAL ARTERY AS A CAUSE OF UPPER URINARY TRACT STASIS*

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Anomalies of the renal circulation are of common occurrence. They are found as abnormal divisions or distributions of an otherwise normal artery given off from the aorta or, as is more important in the present connection, as supernumerary trunks from the aorta. Such an abnormally placed division of the renal artery or anomalous supernumerary trunk may lie in sufficiently intimate contact with the upper ureter or uretero-pelvic junction to interfere with the peristaltic expulsion of urine from the renal pelvis.

The earliest mention of anomalous renal artery as a cause of hydronephrosis is to be found in Rayer's "*Traité des Maladies des Reins*," 1842.¹ Of the fifty-two cases of hydronephrosis collected by Roberts in "*Urinary and Renal Diseases*," 1885,² two were due to this cause. Since the time of these early publications anomalous artery has come to be generally recognized as a definite cause of hydronephrosis. In the present literature the subject is given frequent consideration. Some of these later publications question anomalous artery as a primary cause of hydronephrosis. Geraghty and Frontz³ for example believe that almost invariably there is another cause present and that the enlarging pelvis folds over the artery simply as an incident in the pathologic process. Certainly it is a situation in which cause and effect are easily confused and that such is the sequence of events in some cases there can be no doubt.

Possibly the process is initiated in most cases by some degree of stasis from another cause, of itself unimportant or even temporary. As causes of such stasis may be mentioned functional disorders in the peristaltic activity of the ureter, insignificant narrowings, pregnancy and inflammatory processes. The frequency of anomalous renal artery without hydronephrosis proves conclusively that in most instances the contact with the ureter is without incident. A slight distention of the ureter and pelvis from any cause, however, even though it

be temporary, may so increase the pressure of contact that grooving and folding of the ureter begin. Such deformity becomes an independent cause of obstruction. Contact with the artery and increased uretero-pelvic pressure above this point are now mutually maintained. What was formerly an innocent vascular anomaly becomes an important factor in pathology.

Whatever may be the exact explanation of the pathologic physiology of the process it is a fact that the present literature records numerous cases in which this was the only cause of obstruction which could be determined. Quinby⁴ has recently reported six such cases. From the standpoint of the importance and frequency of anomalous artery as a cause of hydronephrosis the publication of Mayo, Braasch and MacCarty⁵ is most significant. In twenty-seven cases of hydronephrosis anomalous arteries were noted in twenty. In thirteen of these simple division of the artery cured the condition. That is to say anomalous arteries were present in 74 per cent and were apparently the cause of the disease in 48 per cent of the cases.

Most of the cases of this sort reported describe well established hydronephroses (pelvic capacities of 150 c.c. or more). From this general fact the inference is that no criteria for early diagnosis are available. As a result surgical treatment is delayed until extensive dilatation has ensued, marked impairment of function is manifest or the prolonged painful symptoms force resort to surgical exploration. This is undertaken in the hope, but not without misgiving, that a situation may be found correctible by a surgical procedure short of nephrectomy.

It is obviously to be desired that the presence of such offending renal arteries be recognized before they have wrought these extensive anatomical changes with entailed impairment of function and long period of suffering. It should be of value to point out clinical means of recognizing these cases while they are still in a condition well described as "stasis" and before they have advanced to the more extensive damage described as "hydronephrosis." The purpose of the present paper is to point out certain criteria to be found in the pyelogram which, taken in association with the other clinical features, permit a diagnosis of upper urinary tract stasis due to anomalous renal artery to be made with reasonable assurance and at an early stage of the process.

*Presented before the annual meeting of Minnesota State Medical Association, St. Paul, October, 1923.

In the present literature concerning anomalous artery obstruction there is not available any detailed and comprehensive consideration of all the features of the pyelogram which may be of value

this experience it is felt that the pyelogram almost regularly exhibits a congenital type of deformity of distinct diagnostic value not hitherto emphasized in this connection. The observations leading to the importance which is attached to this feature of the pyelogram may be best presented by reference to the clinical histories of the cases affording the observations. In this reference to cases clinical detail, completeness and sequence will be subordinated to development of the subject.

On careful dissection and examination of a hydronephrotic kidney (Fig. 1) removed at operation, three sets of vessels, an artery and vein in each case, were found entering the hilum anterior to the pelvis, a set at the upper angle, a set at the middle and a set at the lower angle. The last vessels lay in intimate contact with the uretero-pelvic junction, which they compressed and deeply grooved. The uretero-pelvic junction was hooked-up on these vessels and partially kinked over them. The dilated pelvis showed a dichotomous branching into upper and lower halves just at its entrance into the hilum. On section (Fig. 2), it was found that each intra-renal half gave off superior, middle and inferior calices, all of which were greatly dilated.

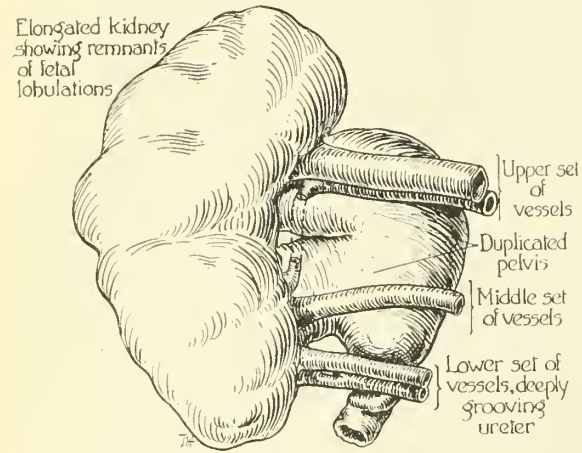


Figure 1. First case cited. Kidney removed at operation. Three sets of renal vessels. Those entering the lower angle of the hilum lie in intimate contact with the uretero-pelvic junction which they compress and deeply groove. There is well marked dilatation of the pelvis, which divides into upper and lower halves before entering the hilum.

in diagnosing the condition. Various writers, however, allude to certain individual features which may be of such value. For example Braasch⁶ speaks of and illustrates a "pyriform dilatation" of the pelvis as peculiar to anomalous artery obstruction. Sanes⁷ briefly mentions "pear shaped dilatation" as characteristic of the condition, but goes no further⁸ in describing this feature of the pyelogram. Crabtree⁹ gives particular importance to absence of filling of the uretero-pelvic junction area or demonstrable constriction in this region. He reports nine cases with reproductions of the pyelograms in which he considers such deformity to be present. Mention is frequently made of kinking and folding of the ureter as seen in the pyelograms of these kidneys.

Filling defects, demonstrable compression, kinking and folding of this sort, when present, are of great diagnostic importance, but in the early stages of the process may be well-nigh incapable of demonstration in the pyelogram. Pelvic or ureteral dilatation due to such incomplete obstructions probably occurs only after a considerable time and even when present is practically impossible to recognize as definitely characteristic.

During the past year a number of these cases have been encountered and carefully studied. From

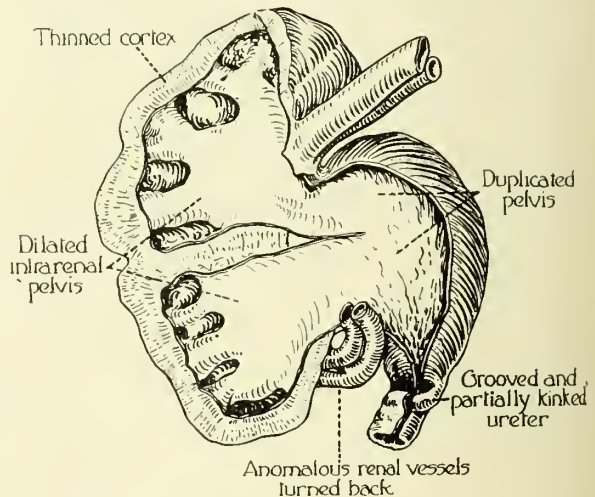


Figure 2. First case cited. Cross section of same kidney shown in Figure 1. The lower set of vessels have been lifted away from the uretero-pelvic junction to show the grooving and effectual obstruction which they produce at this point. Slight enlargement and thickening of ureter below probably due to inflammatory change. Note the complete duplication of the intra-renal portion of the pelvis and extensive dilatation and thinning of kidney substance.

The earliest embryologic faults which we know could determine this anomaly of the pelvis were either the development of two ureteral buds from

the wolffian duct with later fusion of the stalks into a common pelvis and ureter or a prematurely early dichotomous branching of a single ureteral bud, each branch going on to the formation of three nor-

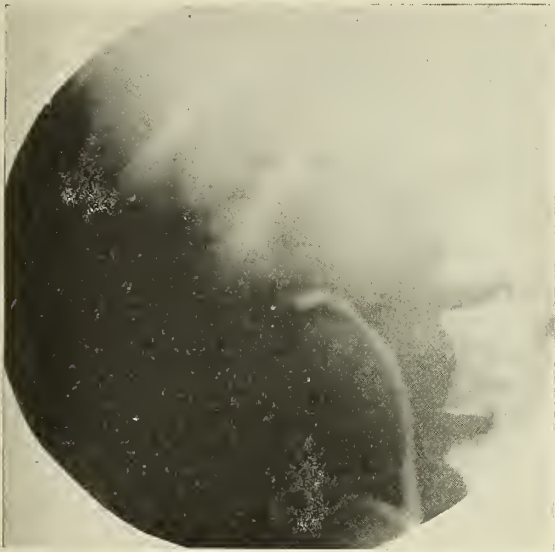


Figure 3. First case cited. Pyelo-ureterogram of kidney shown in Figures 1 and 2. Dilatation so advanced that detailed pelvic configuration can not be made out. No significant dilatation of ureter, but a fold, obstruction or filling defect at its junction with the pelvis is evident.

mally disposed major calices. In either case the development of the permanent vascular channels of this kidney followed the same early division as exhibited by the earlier fetal development of its partially duplicated pelvis.

Unfortunately the extensive dilatation of the pelvis in this case gave a pyelogram (Fig. 3) in which all detail of calyx configuration was obliterated, there appearing on the plate only large overlapping shadows of bromide solution. There is an apparent folding and possibly an unfilled groove at the uretero-pelvic junction. Such folding and filling defect, however, probably is of late occurrence in the process.

It was possible to compare the configuration of this pelvis, as seen after removal of the kidney, with the pyelogram of a previous case of anomalous renal artery obstruction. This patient had been operated on at a much earlier stage and before any appreciable dilatation had taken place. Severe and persistent painful symptoms over a period of five months and apparently characteristic of upper urinary tract stasis led to a kidney exploration. All available measures had excluded a diagnosis of calculus. Ureteral dilatations on the suspicion of

a ureteral stricture had failed to give relief and symptoms persisted after clearing up by lavage a mild pyelitis which had been present. At operation two sets of renal vessels were found, one set entering the upper angle of the hilum and one set entering the lower angle. The latter vessels crossed and lay in intimate contact with the uretero-pelvic junction. Unfortunately this patient's convalescence was marred by the formation of a perinephric abscess which was incised and drained. There was complete relief of symptoms.

Re-inspection of this pyelogram (Fig. 4) for purposes of comparison with the pelvic outline found by dissection in the later case showed a tendency to duplication of the pelvis. The definiteness of the anomaly, however, was by no means striking. It was scarcely comparable to the almost complete duplication seen in the latter case. Nevertheless it was now felt that possibly this feature of the pyelogram might have some significance in connection with the occurrence of anomalous vessels. Any filling defect or folding at the uretero-pelvic junction which might have been present would not show because of the presence of the catheter in the ureter.

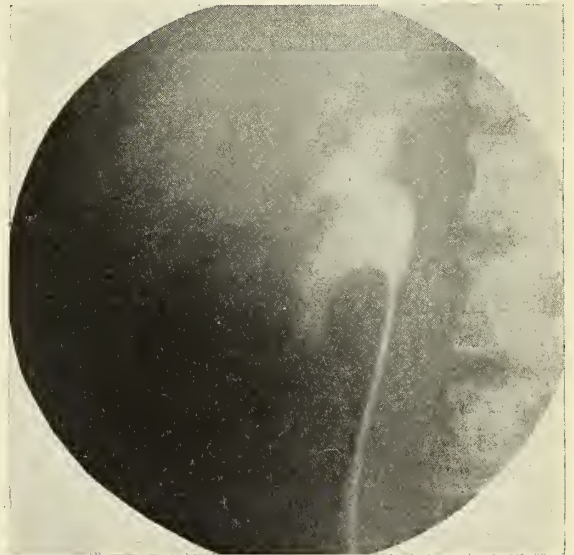


Figure 4. Second case cited. Pyelo-ureterogram showing a tendency to division (reduplication) of the pelvis into rudimentary upper half and more nearly normal lower half. No defect at the uretero-pelvic junction is evident; possibly due to the splinting effect of the catheter which had not been withdrawn.

A third case afforded additional opportunity for observation. This patient had complained for two years of vague pain in the upper right part of the abdomen without typical radiation, but subject to

periods of considerable severity. There was tenderness in the right costo-vertebral angle. The pyelogram (Fig. 5) showed a partial duplication of the pelvis into a rudimentary upper half and more



Figure 5. Third case cited. Pyelo-ureterogram showing a rounded bulging true pelvis with partial duplication into small upper portion and larger lower portion. Overlapping or grooving of the uretero-pelvic junction is evident. Early hydronephrosis.

nearly normal lower half. Superior, middle and inferior calices were given off from each division and the whole pelvis showed a moderate degree of dilatation. Deformity at the uretero-pelvic junction was present, but its nature was not evident. A diagnosis of obstruction at this point due to anomalous renal artery was made on the basis of the partial duplication, of the pelvis, though it must be said without absolute confidence. At operation an anomalous set of vessels entering the mesial surface of the kidney, just below the lower angle of the hilum, was found. (Fig. 6.) They lay in intimate contact with the ureter, which they crossed just below the pelvis. At the point of contact the ureter was grooved and the dilated pelvis bulged above the constriction. Division of these vessels gave complete relief of symptoms.

A fourth case represented a much earlier stage in the process. The patient had experienced but one protracted attack of fairly typical pain which had lasted for five weeks and was still present. There had been slight bladder irritability. The only positive physical finding was tenderness of the right flank. The pyelogram (Fig. 7) showed a tendency to duplication of the pelvis. Again there was the

rudimentary upper division and more nearly normal lower division each giving off its calices. An unequivocal diagnosis of upper urinary tract stasis due to anomalous renal artery was made. At operation three separate arteries were found entering the hilum of the kidney. They were followed medially a distance of 3 or 4 cm., but were not found to join a common trunk. The vessel entering the lower angle of the hilum lay in intimate contact with the uretero-pelvic junction, but there was no groove and the pelvis did not bulge over it. Division of the vessel gave immediate and complete relief of symptoms. The day following operation the patient was able to say that she was completely free of the pain which had been constantly present during the previous five weeks.

These four cases are all examples of the same pathologic process. The ages of the four patients at the time of their first symptoms were nineteen, thirty-two, thirty-three and forty-six years. In all of them pain was the chief symptom. In three there was quite well localized tenderness in the flank though in none was a palpably enlarged kidney demonstrated. In two there were no urinary symptoms while in the others frequency of urination was noted. Pus cells in the urine varied in the four cases from a few to none at all. X-ray ex-

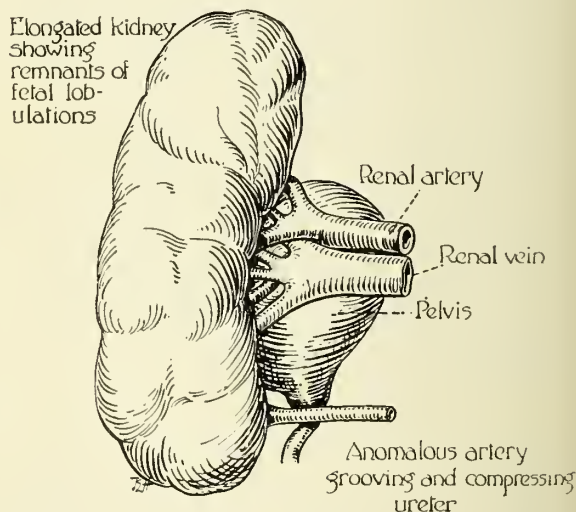


Figure 6. Third case cited. The kidney as found at operation, showing the contact of the anomalous vessel with the ureteropelvic junction. (Both a vein and artery were present; only the artery is shown in the sketch.)

amination of the uninjected kidney was negative in all.

This clinical picture conforms fairly well with that drawn by Quinby⁴ for anomalous artery ob-

struction and based on a series of cases with full and carefully taken histories. The picture is simply one of pain fairly well localized to the vicinity of the kidney and exhibiting a tendency to periodically increased severity together with definite ten-

cation of the pelvis varying from almost complete duplication to only a tendency to this anomaly. In two of the cases this feature of the pyelogram together with the general clinical picture of upper urinary tract stasis led to correct diagnosis before operation.

The finding of an anomalous renal artery as the cause of obstruction in all four cases came after other causes of obstruction had been excluded to the extent that they can be by modern methods in urology.



Figure 7. Fourth case cited. Pyelo-ureterogram showing slight dilatation of the pelvis. The terminal irregularities of the upper calices are well preserved. The apparent poor filling of the upper ureter may be due to decreased density of overlying gas in the intestine. The upper margin of this area of decreased density, however, corresponds to the position of contact of the anomalous vessel found at operation. Note the distinct tendency to duplication of the pelvis into small upper portion and larger lower portion. Compare with Figures 4 and 6. This relationship as to size of the upper and lower portions is the rule even with complete duplication including the whole pelvis and ureter, the upper portion usually being rudimentary.

derness in the flank. Except for these positive things the four cases presented little else in common. With such symptoms however the absence of stone, ureteral stricture or persisting infection and negative cystoscopic examination might be mentioned as significant negative findings common to all.

The degree of pelvic dilatation shown in the pyelogram was roughly proportionate to the duration of symptoms. In the first and third cases described symptoms had been present for six and twelve years respectively. In these the pyelogram showed, in the first, a well advanced hydronephrosis and, in the third, a well marked dilatation of the pelvis. In the other two symptoms had been present for a few months in one and a few weeks in the other. Only slight pelvic dilatation was evident in one.

In all four cases there was some degree of dupli-



Figure 8. For comparison. Pyelo-ureterogram. Normal pelvis and ureter.

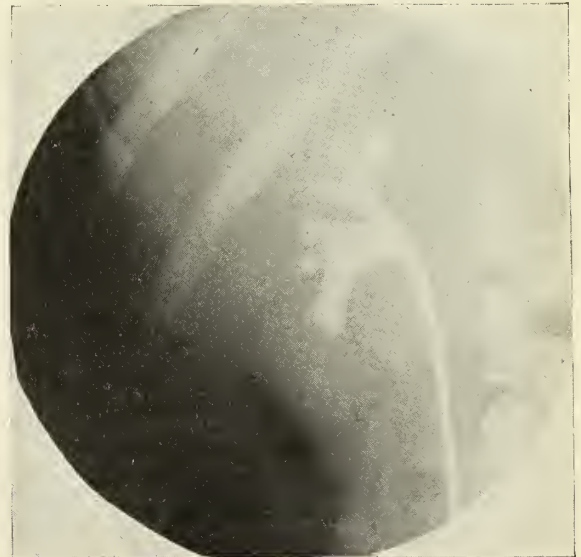


Figure 9. For comparison. Pyelo-ureterogram. Distinct partial duplication without evident pathologic change. (Case of spontaneously passed minute calculi.)

It is not intended to give the impression that a tendency to duplication of the pelvis is thought pathognomonic of anomalous renal artery obstruction. It is possible to sharply distinguish between



Figure 10. For comparison. Pyelo-ureterogram. Bizarre type of renal pelvis. Possibly a tendency to duplication. Symptoms of upper urinary tract stasis.

the ideally normal pelvis (Fig. 8), perfectly formed and giving off superior, middle and inferior calices and the one showing partial division of the true pelvis into two halves each of which gives off separate calices (Fig. 9). Between the two, however, there are all gradations varying from a slight over-size of one major calyx to bizarre forms in which there is a tendency to duplication with usually one division rudimentary and the other predominant (Figs. 10 and 11). For these reasons duplication is necessarily a variable feature and relative term. Furthermore, while embryology gives good reason why vascular anomalies should follow pelvic anomalies the sequence is not invariable.

As mentioned above most of the cases of anomalous artery obstruction to be found in the literature describe fairly well advanced hydronephroses, many requiring nephrectomy. The explanation of this is not that these cases seek medical advice only in the late stages of the process, but that they are not recognized when first seen. In its early stages an obstructed point in the ureter from the contact of an anomalous artery is peculiarly difficult to demonstrate. It is a deformity or collapse from pressure without alteration of structure. There is

no point of narrowing to obstruct the passage of a catheter or to be felt with a bougie. There is no kinking of the ureter demonstrable by alterations in its course. The fluid injected for pyelography may sufficiently overcome the pressure to permit enough filling to obscure the collapse. For these reasons the obstruction is not recognized and if severe and typical symptoms do not force resort to surgery the process is allowed to go on. Eventually the later effects of obstruction are exhibited: greatly dilated pelvis, marked impairment of function and possibly infection. Exploration or nephrectomy is now warranted and refinements of diagnosis are of no practical value.

Cases exhibiting none of these extensive changes and well classified under the term "upper urinary tract stasis" present a very difficult problem in diagnosis. The feature of the pyelogram which has been described may be taken as a *criterion for the probable presence of an anomalous arrangement of the renal blood vessels*. Together with the absence of other demonstrable causes of obstruction



Figure 11. For comparison. Pyelo-ureterogram. Bizarre type of renal pelvis. The superior calyx is not well shown. It extends up over the twelfth rib, is distinctly oversized and possibly represents a tendency to duplication. Appendectomy for "Chronic Appendicitis." Symptoms of upper urinary tract stasis persist.

and a conforming clinical history it permits a diagnosis of obstruction from this cause to be made with reasonable assurance and before extensive damage has taken place.

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DISCUSSION

DR. GILBERT J. THOMAS, Minneapolis: I am very much interested in the paper which Dr. Foley has presented. I have observed a rather large number of hydronephroses due to anomalous blood vessels. In my experience high obstructions in the ureter not caused by stone or demonstrable infection are caused by anomalous renal vessels. I have not observed the anomalies of the kidney pelvis in conjunction with anomalous renal vessels.

If Dr. Foley's observations are correct, he has given us additional data which will greatly assist in making an early diagnosis of hydronephrosis caused by anomalous blood vessel. In looking over the records of my recent cases, I find one which parallels Dr. Foley's reports. The lantern slide will show a pyelogram of the kidney. There are two pelves, one above the other, with no apparent communication. This is probably a double kidney. The lower pelvis is an infected hydronephrosis. The upper pelvis is not normal in outline although it is not pathological for anomalous or double kidney. The history in brief is as follows: Patient, female; age, 62 years. Three or four years ago a small lump was felt in the left flank. This was not painful and there were no other symptoms. About a year ago patient had a severe pain in her left flank and at this time the tumor seemed to enlarge. About three or four weeks ago she was seized with another attack of pain and the tumor again enlarged so that it was easily palpable. With the cystoscope we found two ureters on the left side, both of which were catheterized. I was unable to introduce the catheter into the lower pelvis, although sodium iodide could be forced into it. When we operated we found a large fluctuating mass which was somewhat adherent and which filled the entire flank and extended into the bony pelvis. With a trocar the contents of the tumor were aspirated and found to be infected fluid or urine. Slightly less than two quarts of this fluid was obtained. The ureter which opened into the lower end of the large pelvis was not small. About one-half inch below its exit, it was crossed anteriorly by a blood vessel about

twice the size of lead in an ordinary pencil. This vessel held the ureter against the distended pelvis. The vessel itself did not produce a kink where it crossed the ureter, but held it tightly against the pelvis so that the ureter in making a right angle turn just as it made its exit from the pelvis, was distinctly kinked. That part of the ureter above the vessel might have grown forward and downward so that a kink may have occurred where the vessel crossed. I think the obstruction in the ureter in these cases is caused by the ureter falling or growing over the vessel as a soft rubber tube might hang over a line and thus produce a kinking. Because of the poor condition of the patient, we were unable to dissect the complete blood supply to this double kidney. However, the ureter which drained the upper pelvis was free. Because of our inability to isolate the blood supply to the upper kidney, a total nephrectomy had to be done.

DR. WILLIAM F. BRAASCH, Rochester: In 1907 Dr. W. J. Mayo, together with Dr. MacCarty and myself, published a paper calling attention to the fact that anomalous renal blood arteries were a frequent cause of hydronephrosis. My urological friends have frequently questioned me on this subject, saying that they seldom, if ever, could find that anomalous blood vessels were the etiologic factors. I am glad that Dr. Foley in this very able paper could corroborate the frequency of this factor in the cause of hydronephrosis. I am certain that if surgeons would stop and look carefully for the cause of hydronephrosis, the anomalous blood vessel would be found more frequently. I have often seen Dr. Mayo stop and search for several minutes before he found the etiologic factor.

It is particularly of interest that anomalous blood vessels can be a factor in causing hydronephrosis, since they occur so often without obstructing the ureter. It is difficult to ascertain why they should constrict the ureter in some cases and not in others. In some cases at least it is found that the kidney assumes a position so as to permit of such ureteral obstruction.

There are, of course, a number of other causes of hydronephrosis and it would be very difficult to differentiate clinically between the various etiologic factors. Suffice to say that hydronephrosis resulting from anomalous blood vessel obstruction usually occurs in the younger adult and at the time that they attain their greatest anatomic development; in other words, between the ages of fifteen and twenty-five. It has been my experience that it is rather difficult to determine the exact etiologic factor by means of pyelography. Fortunately, it is not of much practical importance to do so, the main problem being to determine the existence of pelvic dilatation.

I would also call your attention to the fact that a pyelogram is not always necessary in the diagnosis of hydronephrosis. In fact, it should not be made where the diagnosis can be made without it, because every now and then, no matter what medium we use, if it is allowed to remain in the dilated renal pelvis, cortical abscesses may form. If the diagnosis can be made by means of withdrawing several ounces of residual urine from the renal pelvis through a ureteral catheter, there would be no object in making a pyelogram.

Probably the most practical factor for your consideration in Dr. Foley's paper is the comparatively frequent incidence of hydronephrosis. The condition is frequently and easily overlooked in the course of a general clinical examination because the urinary findings are negative in a large percentage of cases and the patient may have no urinary symptoms. Furthermore, the pain radiation is not necessarily suggestive of renal involvement and is in fact frequently more anterior than posterior. As a result, a large proportion of patients with hydronephrosis on the right side have had their appendix removed.

I wish to call your attention to the fact that with every lateral abdominal pain which is localized above the level of the umbilicus we should be very careful to rule out hydronephrosis. At the Mayo Clinic every patient that has an upper abdominal pain which is not otherwise identified by clinical data is referred to the urologist to rule out the possibility of hydronephrosis. This is probably one reason why we find so many cases of hydronephrosis annually. As I have said before, Dr. Foley is to be congratulated on the very careful study he has made of this interesting condition.

DR. WILLIAM J. MAYO, Rochester: Dr. Foley has made a real contribution to this subject. The first case of this type in which I operated was dramatic. In drawing up an infected hydronephrosis I didn't recognize an artery running into the lower pouch. These arteries usually run across in the vicinity of the uretero-pelvic juncture, and then well up on the posterior wall of the kidney. I cut this vessel and it dropped back and started a very smart hemorrhage. I finally traced the source of the hemorrhage, well down on the aorta. It was an entirely separate blood vessel and did not come off with the renal vessel.

Dr. Braasch has brought up a question of importance relating to the surgical phase: In what stage of hydronephrosis and with what amount of infection should we attempt to save the kidney? We have had some very interesting experiences in this respect. When I was abroad just before the war, I was asked to open a discussion on tuberculosis of the kidney. One of the most distinguished of the older members of the surgical profession of the country had given a detailed report of seven cases of tuberculosis of the kidney in which the bacillus of tuberculosis, and all the classical symptoms had been noted. These had afterward all disappeared, some without treatment, and some with treatment. The assumption was that for this reason tuberculosis of the kidney had existed, but that the patient had entirely recovered. However, there had been no cystoscopic examination made to show that there was urine coming from the affected side. My inference was that there was a dead kidney on that side, that is, a closed kidney without function, but still tuberculous.

The same point comes up in connection with hydronephrosis. Christian Fenger, who initiated the work on these structures at the uretero-pelvic juncture, and did not, at that time, recognize the relation of an anomalous artery to many of these conditions, was under the impression that an attempt should be made to save every kidney. Now the situation appears to be about this: if there is a perfectly good kidney on one side and a poor kidney on the

other side, if something is done to the poor kidney, for instance a procedure for relief of an obstruction which will relieve the patient of the immediate symptoms, it creates the belief that the kidney is functioning. Yet examination in the course of time will often show that there is no function on that side. If both kidneys are diseased and operation is performed on one kidney and it is saved, so long as function is necessary the poor kidney will continue to function. But if the kidney that has been operated on gets well, the second kidney will cease to function in a considerable percentage of cases. This is rather interesting because it shows nature's conservation in providing sufficient function. But if there is good function on one side and an advanced infected hydronephrosis on the other, even though an operation may relieve the patient of the pain and discomfort, it cannot be assumed, merely because the patient is relieved, that the kidney is functioning.

DR. A. C. STRACHAUER, Minneapolis: Since Dr. Braasch called attention to the presence of these anomalous vessels, surgeons in seeking the cause of hydronephrosis have found that these vessels are of rather common occurrence. There is nothing uncommon about an anomalous vessel crossing the uretero-pelvic juncture and causing an obstruction. I do, however, want to call your attention to the fact that occasionally these vessels are obliterated, and instead of a vessel you find a cord, a cord so definite that you can snap it under the finger. The pyelogram may definitely show a grooving, in early cases; and the release of this, the division of the cord, of course accomplishes the same result that the division of the blood vessel would.

The pyelogram in these cases of obstruction due to either blood vessel or cord from the obliteration of the vessel, should be carefully studied. Occasionally it will be found that the uretero-pelvic juncture instead of being at the most dependent portion of the hydronephrosis sac has been carried up on the side; and there is a certain amount of residual urine in the pelvis. Under these circumstances, in my opinion, the kidney should be decapsulated and a nephropexy performed, the capsule used as ligaments. Care should be taken that no fat comes between the decapsulated kidney and the muscle along the last rib. The kidney is so fastened that its longitudinal axis is changed to a more transverse position, so that the urine drains into the ureter from the pelvis at its most dependent portion.

DR. ARNOLD SCHWYZER, St. Paul: I think I never saw as nice and clear an x-ray picture as in the first picture the Doctor showed us. The relief from the obstruction that one gets by the cutting of an abnormal artery is not always satisfactory. Though we have heard that a nephrectomy is the classical treatment for these conditions, I would like to take another standpoint. The trouble was that we had only the linear method of uretero-pyelo-plasty, the methods of Fenger, Morris, etc. They all simply split the region where we had a stricture or had a kink and united transversely. We see in their illustrations there was a good deal of puckering and in the course of healing a fistula easily forms. In three cases I tried to improve on

that and I am sure I have. If you have a kink at the pyelo-ureteral junction, in releasing the parts from fixing strands you can always stretch it. I then make an incision, a Y-shaped one, with one of the three legs down through the strictured ureter and the other two in the pelvis of the kidney, spreading apart at an angle of 60 degrees. I can now take the flap between these two pelvic branches of the Y down to the end of the lower incision and leave the puckering in the wide part of the pelvis of the kidney. The opening was funnel shaped. In three such cases we had a satisfactory result—one case was not a very good one for the method. It had been operated upon elsewhere by dividing an abnormal vessel but had not had any relief. The relief as long as I could observe the case was marked; but I heard that the patient died a year later from a ruptured extrauterine pregnancy.

The other two cases were one in a young child and one in a young woman. I have not made a cystoscopic examination since, but the two cases have an absolutely clear urine and have had a complete recovery. I always feel that though the surgeon defends that a nephrectomy in these cases is right, he does not feel quite right just the same in the bottom of his soul, when he sees a healthy looking kidney cut out on the table even if this healthy kidney has a large pelvic sac. He cannot feel right.

DR. FREDERIC E. B. FOLEY, St. Paul (closing): I wish to thank those who have discussed my paper for adding so much to its interest.

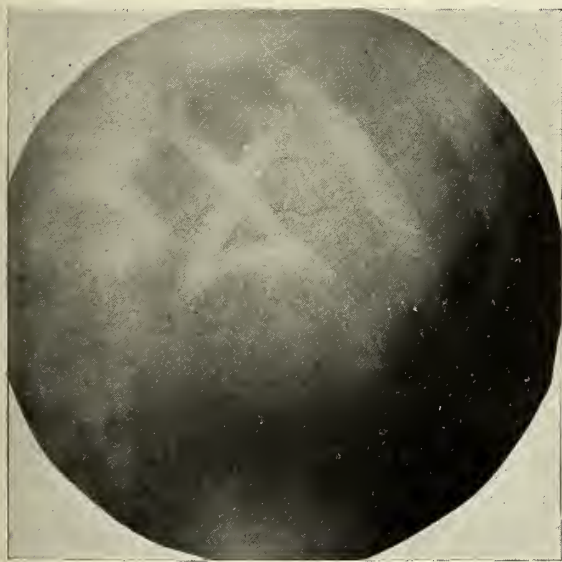


Figure 12. Case cited in closing discussion. Pyelo-ureterogram typical of the so-called bifid pelvis. Although representative of a type of pelvis generally considered normal, the embryologic fault which explains its configuration is doubtless the same as in the case of complete duplication.

If there is time available I will add very briefly another case to those presented in the paper. This patient was not encountered, or at least was not operated upon, until after the preparation of the paper.

A young woman 29 years of age. Ten years ago she had what was probably a Neisser infection; three curettements had been done for "endometritis." Tonsillectomy

three years ago. Gall bladder and appendix removed two years ago. X-ray treatments of a small fibroid in cervix of uterus a year and a half ago.

Her complaint at the time of admission was of frequent painful urination and pain throughout the left side of the abdomen and in the flank. She gave a history of having had periods of this sort of left sided pain for several years. The present attack was the only one associated with bladder symptoms and these began during an attack of influenza before admission.

Physical examination was essentially negative except for very definite tenderness in the left costo-vertebral angle, and tenderness felt on palpation of the flank and along the course of the ureter. A small fibroid was felt in the anterior part of the cervix above the vagina. There were temperature elevations to 99° each day. Many pus cells in the urine.

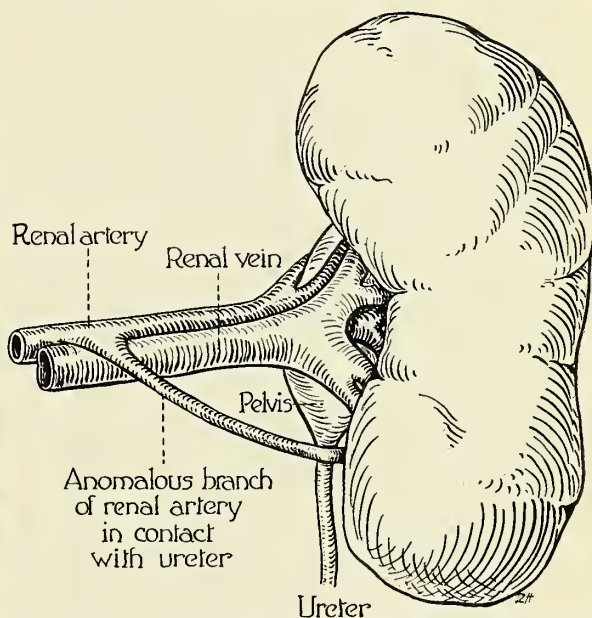


Figure 13. Case cited in closing discussion. The kidney as found at operation, showing the premature branching of the renal artery. The premature branch girdles the uretero-pelvic junction to gain access to the posterior lip of the sinus renalis.

On cystoscopic examination the trigone was seen to be reddened; there was inward displacement of the bladder floor just beyond the trigone due to the fibroid nodule in the cervix. No. 5 catheters passed without resistance on each side. The urine from the left kidney contained an occasional clump of pus cells.

Repeated bladder urine examinations for tubercle bacilli were negative and guinea pig inoculations of the ureteral catheter specimens were also negative.

Treatment consisting of forcing fluids, urinary antiseptics, bladder lavages and lavages of the left renal pelvis gave no persisting improvement. As a result of her distressing symptoms the patient had lost 40 pounds at the end of six months; with this weight loss the left sided pain had become worse. The left pyelogram which had been made at one of the early cystoscopies several months ago was recently re-inspected, figure 12 (shows slide). It shows a very definite partial duplication. A diagnosis of

upper urinary tract stasis due to anomalous renal artery was made. Figure 13 (shows slide) shows the arrangement of the anomalous artery as found at operation. There has been complete relief of the left sided pain since operation. The bladder irritation was relieved for a time but has recurred. It is believed that an infiltration of the bladder neck in relation to the small fibroid (possibly infected) is responsible.

This condition can be easily overlooked at operation unless the surgeon has in mind anomalous vessel as a cause of upper urinary tract stasis without hydronephrosis. The vessel at first is obscured by fat. This is removed and the vessel is seen but with the kidney drawn down into the incision it lies across the pelvis. Push the kidney up into normal position and immediately it is apparent that the vessel lies in very intimate contact with the ureter.

My experience with the diagnosis and treatment of cancer covers a period of almost thirty-one years and can be easily divided into four decades. The effect of the absence of any educational effort is most marked in the first decade up to 1900 and continued to almost 1910. The educational effort began in 1910. The effects were seen within a few years. They are most marked since 1920.

When we compare the results of our records in the first ten years up to 1900 with those since 1920, we may summarize them as follows:

These figures come from the Surgical Pathological Laboratory of the Johns Hopkins Hospital, where we have forty thousand records. These figures include all the cases treated in the Surgical Service of Johns Hopkins Hospital and of St. Agnes Hospital in Baltimore, and during the past five to eight years about one-third of the material has been received from outside sources. But from the very beginning there has been a large amount of material with good records received from physicians and hospitals throughout this country. Our records therefore pretty clearly show the falling curve of inoperability and the rising curve of five-year apparent cures and longer permanent cures.

This improvement is most marked in cancer of the mouth, skin and breast. It is beginning to be marked in cancer of the cervix. There is very little improvement in cancer of the stomach and colon.

Breast. In the first ten years inoperable cases registered almost 40 per cent. The per cent of cancer as compared with benign lesions was almost 80 per cent. The per cent of women seeking examination in whom nothing definite was found in the breast was less than 1 per cent. The per cent of five-year cures in operable cases registered about 20 per cent.

In my own clinic since 1920 the number of women seeking examination at which nothing definite is found has risen from less than 1 per cent to more than 50 per cent. Inoperable cases have fallen from more than 40 to 5 per cent while the per cent of cancer has fallen from 80 to 50 per cent. These changes are associated with the one controllable factor—the duration of the lump known to the patient. In the first ten years the average duration of the lump was almost two years. Since 1920 it has fallen to less than nine months. Our records show that women need no instruction, as to the warning of trouble with the breast. With rare exceptions they are warned in time—they feel the lump, observe the retracted nipple, or the dimpled skin, but they need education to *act* in time.

Tongue. In the first ten years but one patient sought the advice of the clinic for a lesion of the tongue which was not

cancer—about 3 per cent. Today, in my own clinic more than 70 per cent come under observation with leucoplakia, areas of irritation, ulceration, ragged dirty teeth—that is in the stage before cancer has developed, and a period in which cancer can be prevented by the removal of the irritating factors—tobacco and ragged, dirty teeth.

This is the most remarkable effect of the educational effort. In addition, inoperable cases have decreased, and early cancer of the tongue with a probable cure of almost 70 per cent has increased.

Up to the present time the educational efforts have been carried on by a very small minority. There seems no difficulty in getting space in the daily press or magazines, but the efforts are more or less sporadic. It does not seem to be a question of writing the message to the people so it will be read—it seems to be largely a question of multiplying the number in the Medical and Dental Professions who will aid in the teaching efforts and of increasing their efficiency in this new and very essential part of the practice of Medicine.

To eradicate disease such as cancer there must be a very efficient organization. Some diseases can be eliminated by providing good water and food; others can be prevented or cured by a serum. But there is no treatment that offers much for late cancer, and there seems to be no way of getting cancer under treatment in its earliest stages, except by getting to the people a definite, clear-cut message. We must also remember that cancer of the mouth and of the skin, and perhaps cancer of the cervix, are preventable diseases. A cancer of the breast without involvement of the axilla offers 70 per cent chances of a cure, while with the involvement of the axilla this falls to 20 per cent. The duration of the indigestion or discomfort known to the individual in cancer of the colon and stomach is far too long before the thorough examination with the x-rays. My recent evidence shows that many cancers of the colon originate in benign polypoid growths. These growths give definite symptoms in the benign stage and can be felt with the finger, can be seen with the proctoscope, or outlined with the x-rays. In this stage the only failure to cure would be due to operative mortality.

It is therefore the obligation and opportunity of members of the Medical Profession who are also members of the Society for the Control of Cancer to bring these life-saving facts to their own patients, their own colleagues and their own communities.

Sincerely yours,

JOSEPH COLT BLOODGOOD.

From a letter to the New York Committee of the American Society for the Control of Cancer.

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EDITORIAL

Life Insurance Examiners

In this issue of MINNESOTA MEDICINE appear four articles by medical directors of four of the leading life insurance companies of America. The presentation of these addresses was suggested by Dr. C. N. McCloud, Medical Director of the Minnesota Mutual, in an effort to acquaint the profession of Minnesota with some medical facts in regard to life insurance. That such a ready response was forthcoming on the part of four large insurance companies to the request of a county society located in the middle West, is significant of the appreciation on the part of the companies represented of the need of a better understanding of the insurance viewpoint by physicians.

A large percentage of the profession examine for one or more life insurance companies. An enormous sum is paid yearly to the medical profession for services in this connection. Nevertheless few physicians as a matter of fact ever acquire the insurance viewpoint and make good examiners. There is a tendency on the part of the average examiner to slide over certain questions which to him seem absolutely useless and do rather slipshod work.

There is some excuse for the impatience in filling out forms often manifest. Many of those we are required to fill out in connection with insurance work of various kinds are needlessly long and exacting, at times to the point of absurdity. It can be safely said, however, that the medical application blanks of the large insurance companies have been evolved after years of experience and pretty carefully boiled down. Several questions are necessary purely from a legal standpoint. The questions regarding the use of alcohol are in point. Dr. Wenstrand's article showing the actuarial statistics in light, moderate and heavy drinkers are doubtless illuminating to most of our readers. The actual influence on life expectancy is doubtless greater than shown in the chart mentioned for it is human nature to minimize one's questionable habits when applying for life insurance.

We recommend the reading of these insurance articles by all those interested in this kind of medical work. This phase of medical activity has been neglected in the past. Who knows but that the Ramsey County Medical Society has blazed a trail which will be profitably followed by other and larger societies.

State Boards

The intention primarily in inaugurating State Board Medical Legislation was the raising of the standards of the medical colleges, and only secondarily, of necessity, the improvement of the medical personnel of the profession as represented by the graduates of these colleges.

When medical legislation started some thirty-five or forty years ago, medical colleges were in the main commercial institutions. No preliminary demands were made in reference to mental training. Some of the better colleges named a high school course as a requisite, but it was not a rigid requirement. Only a meagre few demanded more than two terms of barely six months each in medical college before granting a diploma as an M.D. Commercialism was the rule, quantity production the desire, and quality not considered. At one time the United States had one hundred and seventy-five medical schools, more than all the rest of the world.

The spring school poison was also injected into the unfortunate condition of medical affairs, so that it was possible for an illy educated individual often with barely grammar school preliminaries to enter

a so-called medical school in October, remain until March, enter a spring school, graduate in June and be a legal M.D. Instances of this kind were numerous. The conditions became intolerable.

Some of the forward looking medical men in Minnesota studied the question, and concluded that some form of legislation was essential and the fundamental starting point was in the changing of medical college standards. The law of 1887 was evolved and three years of at least six months each in a recognized medical school was demanded of each applicant for examination. This met with violent opposition by the medical schools and two of our now foremost institutions began suit to test the constitutionality of the law. The law, however, was executed without favor and gradually all medical schools adopted the three-term standard. Improvement in methods and development in medical knowledge made more time in medical school necessary to grasp enough knowledge for efficiency, so that in 1899 the law was changed to demand four terms in medical college. The colleges all came up to this standard in time. Not until 1912 was the preliminary demand of two years in a College of Liberal Arts over and above a high school course, put in operation. These demands are now made by all Class A colleges.

A provision in the Minnesota Law divorced the personnel of the board entirely from any medical school. No person connected with a medical school could be a member of the Board.

The law should be as brief, mentioning only main principles. Many laws are so filled with detail the board cannot function unless every act is mentioned in the law. There should be some reserve power left for the board to cover any new issue that the passage of time may bring forth.

The different medical cults have caused much confusion in the control of medical legislation. The danger to the public in this lowering of medical standards has not been appreciated by the people. The law is intended for the benefit of the people and not for the medical men as a class. This should always be made prominent, as many assume that it prevents their exercising their liberty of choice as to who shall treat them and how they shall be treated. With the basic fact established that the law intends only to cover the fact of proper educational qualification, both as to certain necessary preliminary education and a high grade medical education, the manner or method of

treatment can be left entirely as a matter of choice. The question of the standardizing of the qualification of all who treat the sick is basic and will eventually prevail. As a compromise many states are attempting to function with a conjoined board, all kinds of treatment being represented on one board. This is a mistake and can only be carried out by lowering the general standards of medical qualification and confusing the public. While the recognizing of each cult by a board is to be deplored, that is far better than the conjoined board. They have to stand or fall by what they deliver to the public and should not be dignified by association with those who have genuine medical and primary training. Three or four standards of qualification in one law have been found most undesirable. Many cannot disassociate medical treatment from a species of necromancy or miracle working, while long training and deep study on the part of the medical man is the only method of making a safe and sane practitioner. This basic fact accepted, there is no place for the conjoined board.

T. McD.

Doctor of What?

"Once upon a time many years ago, when our grandfathers were little children, there was a doctor; and his name was Doolittle—John Doolittle, M.D. 'M.D.' means that he was a proper doctor and knew a whole lot."

So begins one of the popular Doolittle books and the above furnishes a suitable text for some cogitations. Once upon a time the title of doctor meant something. It signified as a rule some attainment in the field of medicine or the ministry. Not so now. Any one of a variety of duly licensed institutions may dispense a degree of doctor of this or that. And with the recent influx of quasi-medical doctors such as naturopaths, chiropractors et al, the title of doctor has come to carry with it a certain amount of opprobrium.

The title doctor may designate a clergyman, D.D.; physician or surgeon, M.D.; professor, Ph.D., D.D., or LL.D.; dentist, D.D.S.; veterinary, V.M.D.; osteopath, D.O.; chiropractor, D.C.; naturopath, N.D.; et cetera ad nauseum, and is anything but discriminating. The recent disclosures of the "diploma mills" have only served to further depreciate the term doctor, so much so that we are informed the California state board of medical examiners is contemplating legislation to abolish the

term doctor entirely and to require the use of the initials, M.D., D.D., and so forth. More legislation, and fantastic legislation at that; for, unless nationwide, no relief for the situation will be afforded.

There seems to be no word in the English language which quite designates the M.D. The word physician is not ordinarily used to include the surgeon. The phrase "physician and surgeon" is too cumbersome. In England the surgeons are plain Mist'ers.

We shall probably never shake off our doctor titles. While the M.D. stands for doctor of medicine, and few of us would want to be known primarily as prescribers of medicine, the initials represent our degree and should be more generally used. We would bequeath without a tear the abbreviated title "Doc" to any or all of the many present day half doctors.

OBITUARY

DR. JAMES McAULIFFE

Dr. James McAuliffe of Duluth died at the age of 66 years at St. Mary's Hospital, Duluth, March 23, 1924.

Dr. McAuliffe was born at Olean, New York, where he spent his early years. He was graduated from Buffalo Medical College, Chicago, and took a post-graduate course at Bellevue Hospital, New York, specializing in eye, ear and nose diseases. In 1887 he came to Duluth and practiced there until the fall of 1922, when he suffered a stroke while out hunting.

He had been confined to the hospital practically ever since, with the exception of a short time when he was able to leave and reside in his rooms at the Lenox Hotel, where he had made his home for a number of years.

Dr. McAuliffe was a member of the local council of Knights of Columbus, in which he took an active part for a number of years. He was the examining physician for Duluth for the order for many years. He was also deputy coroner and acted as coroner during the late war, when Coroner Charles F. McComb was away in service. He was a member of his county and state medical associations.

Surviving are his son, James, and a brother, John J. McAuliffe, Duluth, and five brothers and two sisters in Olean, New York.

The following tribute paid Dr. McAuliffe through the columns of a home paper gives evidence of the esteem in which he was held in his own community:

"In the passing of Dr. McAuliffe Duluth has lost one of its finest citizens. He died richer in friendship than most men, through his skill as a physician and surgeon, his self-sacrifice for others and his devotion to the welfare and happiness of the members of the circle within which he lived. He died poorer in worldly possessions than most men, because of his honesty, his self-sacrifice and his

willingness to serve the poor and the little ones in this world without pay, at any time during night or day, no matter what conditions existed.

"In his kind, benevolent way, he exemplified the highest ideals of that church to which he belonged. He was a servant and follower of Jesus Christ, and he gave unstintingly of himself and of what little he possessed to those in need. The cheer and the comfort that he brought in the home of sickness and death will never be forgotten by those who knew him and whom he served.

"As a physician he occupied a position attained by few. He was careful, reliable and efficient, and his standing among his brother physicians was unequalled. Doctors Charles and Will Mayo of Rochester considered him most reliable, and his word and diagnosis were taken by them as authoritative. He was considered one of the most reliable and dependable physicians in the St. Louis County Medical Society."

DR. O. K. EGGEN

Dr. O. K. Eggen was born in Levanger, Norway, in 1882 and came to America with his parents at the age of three. He attended the Red Wing Seminary for four years and Hamline University two years, before going to Philadelphia for his medical work at the Jefferson Medical College, where he was graduated in 1909.

After this he began practice in Minneapolis, where he had remained ever since, being on the staff of St. Mary's Hospital. He was an office associate of Dr. Joe M. Neal.

Dr. Eggen married Miss Anna Hart in 1914. Her death occurred one year ago. Dr. Eggen was a member of the Court of Honor Lodge and of the County and State Medical Societies and the American Medical Association.

On March 26th he was struck by an automobile and died the next day as the result of his injuries. He is survived by three sisters, Mrs. Glaeser of Minneapolis, Mrs. Orstad and Mrs. Mortret of Ottawa, Iowa, and by two brothers, John and Carl Eggen of Edmonton, Canada.

DR. LYMAN P. FOSTER

Dr. L. P. Foster, 88 years old, a resident of Minneapolis since 1848 and one of the oldest practicing physicians in that city, died at his home in April, 1924.

Dr. Foster was born in Pittsburgh, November 5, 1836, and with his parents came to St. Anthony Falls in 1848. In 1853 he attended the first session of the University of Minnesota. He had lived in Minneapolis continually since that time, remaining active in his practice until a few weeks before his death.

Graduating from Duff's College, Pittsburgh, in 1856, Dr. Foster returned to Minneapolis and in 1858 was admitted to the Minnesota bar, beginning practice as an attorney in 1860 at St. Anthony Falls. In 1873 he attended Rush Medical College and Hahneman Medical College, both in Chicago. He was assistant professor at the Hahneman College in 1881 and 1882.

For many years Dr. Foster was active in church work. He was ordained an elder in the Methodist Episcopal Church in 1874.

Surviving are his widow and four daughters.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

SOUTHERN MINNESOTA MEDICAL ASSOCIATION OFFICERS

Dr. F. P. Strathern, St. Peter, president.
Dr. C. J. Holman, Mankato, first vice-president.
Dr. A. Gullixson, Albert Lea, second vice-president.
Dr. H. T. McGuigan, Red Wing, secretary-treasurer.

PROGRAM COMMITTEE

Dr. H. W. Meyerding, Chairman, Rochester.
Dr. F. C. Heise, Winona.
Dr. F. R. Huxley, Faribault.

EXECUTIVE COMMITTEE

Dr. W. F. Braasch, Chairman, Rochester.
Dr. J. W. Andrist, Owatonna.
J. S. Holbrook, Mankato.
COMMITTEE ON ARRANGEMENTS FOR MANKATO MEETING
Dr. J. T. Schlesselman, Chairman, Mankato.
Dr. C. C. Pratt, Mankato.
Dr. A. G. Liedloff, Mankato.

The annual meeting of this association will be held at Mankato, Monday, May 19, 1924. The scientific program will be called at 8:00 A. M. The annual business meeting will take place at 5:30 P. M. Following the banquet at 6:30 P. M. the association will be addressed by Dr. Dean Lewis, of Chicago, and Dr. W. J. Mayo.

Members of the profession are invited to attend the meetings and provision is being made to entertain visiting ladies.

Dr. J. T. Schlesselman, Mankato, has charge of hotel and banquet reservations.

The following interesting program has been arranged:

1. RADIUM IN BENIGN CONDITIONS OF THE NOSE AND THROAT. Dr. Laura A. Lane, Minneapolis. Discussor: Dr. B. E. Hempstead, Rochester.
2. LARYNGEAL OBSTRUCTION IN ACUTE INFECTIOUS DISEASE. Dr. S. W. Adler, Winona. Discussor: Dr. Walter Ramsey, St. Paul.
3. INTUSSUSCEPTION IN INFANCY. Dr. W. B. Grise, Austin. Discussor: Dr. F. C. Rodda, Minneapolis.
4. THE ROLE OF DIET IN THE TREATMENT OF DISORDERS OF OLDER CHILDREN. Dr. Frederic Wm. Schlutz, Minneapolis. Discussor: Dr. H. F. Helmholtz, Rochester.
5. HYPERTENSION: AN INDEX TO TOXEMIA OF PREGNANCY. Dr. R. D. Mussey and Dr. L. M. Randall, Rochester. Discussor: Dr. J. C. Litzenberg, Minneapolis.
6. SOME NEW PROBLEMS IN OBSTETRICS. Dr. W. H. Condit, Minneapolis. Discussor: Dr. John L. Rothrock, St. Paul.
7. FACTORS IN OPERABILITY OF ACUTE APPENDICITIS. Dr. W. P. Finney, Rochester. Discussor: Dr. A. C. Strachauer, Minneapolis.
8. PRE-OPERATIVE AND POST-OPERATIVE CARE OF SURGICAL PATIENTS. Dr. A. E. Sohmer, Mankato. Discussor: Dr. W. W. Walters, Rochester.
9. TREATMENT OF NASAL DEFORMITIES. Dr. G. B. New, Rochester. Discussor: Dr. Carl Waldron, Minneapolis.

10. OSTEO-CHONDRAL GRAFTS TO SKULL. Dr. A. M. Hanson, Faribault. Discussor: Dr. A. R. Colvin, St. Paul.
11. FOREIGN BODIES IN THE ESOPHAGUS AND AIR PASSAGES. Dr. P. P. Vinson, Rochester. Discussor: Dr. K. A. Phelps, Minneapolis.
12. PNEUMONIA AND ITS TREATMENT WITH PNEUMOCOCCUS ANTIGEN. Dr. D. B. Pritchard, Winona. Discussor: Dr. E. C. Rosenow, Rochester.
13. CLINICAL ASPECTS OF CORONARY SCLEROSIS. Dr. F. A. Willius, Rochester. Discussor: Dr. J. S. Gilfillan, St. Paul.
14. HIP FRACTURES. Dr. A. G. Liedloff, Mankato. Discussor: Dr. H. W. Meyerding, Rochester.
15. INJURIES OF THE CARPAL BONES. Dr. Emil S. Geist, Minneapolis. Discussor: Dr. C. C. Chatterton, St. Paul.
16. TREATMENT OF BURNS. Dr. Arthur Collins, Duluth. Discussor: Dr. A. W. Ide, St. Paul.
17. THE VALUE OF PROCTOLOGY IN GENERAL PRACTICE. Dr. L. A. Buie, Rochester. Discussor: Dr. W. A. Fessler, Minneapolis.
18. X-RAY THERAPY ON SOME COMMON SKIN DISEASES. Dr. A. J. Wentworth, Mankato. Discussor: Dr. W. H. Gockerman, Rochester.
19. SURGICAL TREATMENT NON-TUBERCULAR PULMONARY SUPPURATION. Dr. C. A. Hedhloim, Rochester. Discussor: Dr. F. W. Wittich, Minneapolis.
20. ROLE OF IODINE IN PREVENTION OF GOTTRE. Dr. Henry S. Plummer, Rochester. Discussor: Dr. C. H. Mayo, Rochester.

MINNEAPOLIS CLINIC WEEK

Minneapolis Clinic Week will be held Tuesday, Wednesday, Thursday and Friday, May 6, 7, 8 and 9, with headquarters at the Radisson Hotel. The first two days, May 6 and 7, will be devoted to dry clinics to be held in the Unitarian Church, Eighth St. and La Salle Ave. The following days, May 8 and 9, will be devoted to clinics at hospitals from eight o'clock until noon. The afternoons will be given over to the presentation of dry clinics in the Gold Room at the Radisson Hotel. Any physician from outside the Twin Cities may send in his patient for a dry clinic demonstration.

Minneapolis Clinic Week is to be closely associated with the Minneapolis Health Exposition which will be in operation from May 3 to 12 at the Armory Building, Minneapolis, where the various phases of public health work, educational work related to public health measures, and commercial exhibits related to both will be carried on.

The Annual Banquet given by the Hennepin County Medical Society will take place the evening of Wednesday, May 7th, at the Radisson Hotel.

ANNUAL HEALTH EDUCATION CONFERENCE

At the invitation of the Massachusetts Institute of Technology, a working conference in Health Education is to be held June 23-28 at Cambridge, Massachusetts. The conference called by the Health Education Division of the American Child Health Association will be limited to 100. Registration must be made in advance. Address Emma Dolfinger, 370 Seventh Avenue, New York City.

THE NORTHWESTERN MEDICAL OFFICERS' ASSOCIATION OF THE WORLD WAR

A meeting of the Northwestern Medical Officers' Association of the World War will be held Tuesday evening, May 6, 1924, at 6:30 o'clock at Schiek's Cafe, Minneapolis. The meeting will consist of a dinner to be followed by entertainment. The address of the evening will be given by Mayor George E. Leach, of Minneapolis. Any medical officer who saw service in the World War is eligible to membership in the Society and is urged to attend the meeting. Dr. Stanley R. Maxeiner, 301 Physicians & Surgeons Bldg., Minneapolis, is in charge of reservations.

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

The regular meeting of the Southwestern Minnesota Medical Society will be held Thursday, May 22, 1924, at Luverne, Minnesota. The program includes the following addresses.

President's Address—Dr. G. G. Balcom, Lake Wilson.

"Pyelo-Ureteritis of Pregnancy"—Dr. E. L. Perkins, Sioux Falls, S. D.

"Gastric and Duodenal Ulcer"—Dr. A. E. Booth, Minneapolis.

Case Report—Dr. L. M. Gerber Ditmeier, Jasper.

AMERICAN MEDICAL ASSOCIATION

The official call to officers, fellows and members of the American Medical Association for the annual meeting to be held this year in Chicago has been sent out.

The House of Delegates will convene on Monday, June 9th, the sections meeting Wednesday, Thursday and Friday morning, June 11, 12 and 13.

Minnesota's two delegates are Dr. J. L. Rothrock, St. Paul, and Dr. J. C. Litzenberg, Minneapolis, the alternates being Dr. J. F. Corbett, Minneapolis, and Dr. O. W. Parker, Ely.

LYMANHURST SCHOOL FOR TUBERCULOUS CHILDREN

The following program will be presented before a meeting of the Lymanhurst and Parkview medical staffs at the Lymanhurst School, Minneapolis, Tuesday evening, May 27, 1924, at 7:00 o'clock:

Twenty Years' Observation of Tuberculosis Control—Dr. E. L. Tuohy, President of the St. Louis County Tuberculosis Commission, Duluth, Minn.

Report of Von Pirquet Tests in 1,500 Children in a Minnesota Rural Community—Dr. S. A. Slater, Superintendent, Southwestern Minnesota Sanatorium, Worthington, Minn.

All persons interested in tuberculosis are invited to attend this meeting.

OF GENERAL INTEREST

Dr. and Mrs. Paul O'Leary have returned from San Antonio, where they spent the winter.

A class of twenty-four nurses was graduated from Eitel Hospital, Minneapolis, Friday evening, April 25.

Dr. and Mrs. C. Darcy Wright of Minneapolis have returned from Florida, where they spent the winter.

Dr. F. G. Kohler, formerly of Hector, is now located in Minneapolis, where he has opened offices in the McKnight Building.

Dr. P. P. Vinson, Rochester, spoke before the sectional meeting of the American College of Surgeons in Columbus, Ohio, March 24.

Dr. J. A. Wilkins, who has been at the Mayo Clinic for several years, has gone to Norfolk to enter the practice of internal medicine.

Dr. Gordon B. Kamman of Saint Paul is now associated in the practice of his profession with Dr. C. E. Riggs in the Hamm Building.

Dr. J. G. Meisser, who has been associated with Dr. Roscnow for several years, has left for Cleveland to work with Dr. Weston A. Price.

Dr. W. O. Ott, who was Dr. Adson's assistant at the Mayo Clinic, has announced his connection with the Harris Clinic of Fort Worth, Texas.

Dr. W. H. Hengstler, formerly of Saint Paul, is now in California, where he contemplates making a permanent location for the practice of medicine.

Dr. A. J. Clay of the Clinic of Drs. McGregor, Hanna and Clay of Fargo, N. D., has left for Barnes Hospital, St. Louis, Mo., where he will take a month's course in insulin treatment of diabetes.

Dr. F. W. Gaarde and Dr. R. M. Wilder, of Rochester, attended a meeting of the Billings Club in Chicago, April 1, at which the seventieth birthday anniversary of Dr. Billings was celebrated.

Dr. R. D. Carman gave a memorial address at the services held last month at Washington University for Dr. Walter Mills, with whom he had been associated in his earlier work with x-ray.

Dr. Carl M. Oberg, Minneapolis, left for Europe May 1. After a few weeks' travel in the Scandinavian countries, he will go to Vienna to attend the clinics there. Dr. Oberg expects to return in October.

Dr. A. A. Rankin, formerly of Waconia, is now located at Brownston, where he has taken over the practice of Dr. O. J. Engstrom. Dr. Engstrom is now associated in practice with Dr. E. H. Smith at Bemidji.

Dr. Paul D. Berrisford, Saint Paul, addressed the Washington County Medical Society at Stillwater, March 11, on the subject "Acute Infection of the Nasal Accessory Sinuses" with lantern slide illustrations.

Dr. A. W. Jones, of Red Wing, who has been a member of

the board of education of that city for fifteen years and president of the board for four years, has declined renomination and will retire at the May meeting.

Dr. M. F. Guyer, Professor of Zoology, University of Wisconsin, gave the fifth in the series of lectures on heredity under the auspices of the Mayo Foundation and its chapter of Sigma Xi, Friday, March 28. His subject was "Eugenics."

Dr. William Clark and his associate, Dr. Eugene J. Asnis, of Philadelphia, spent the week of April 7 to 14 in Rochester, and gave Mayo Foundation lectures on April 10 and 11 on electrodesiccation and coagulation in the treatment of neoplastic disease.

Dr. and Mrs. Orville N. Meland, formerly of Warren, now of Saint Paul, have returned from a trip abroad. They spent the winter in London, Paris and Vienna, where Dr. Meland attended the various clinics, and before leaving visited for six weeks on the Riviera and in the principal Italian cities.

Dr. Wallace H. Cole, Saint Paul, addressed the March meeting of the Minnesota Pathological Society on "Asymmetrical Chondrodysplasia with Report of a Case." Other papers given were "Dwarfism" by Dr. Wm. A. O'Brien, Minneapolis, and "Blastomycotic Meningitis with Report of a Case" by Dr. L. R. Gown, Minneapolis.

Professor A. E. Stewart, professor of agricultural physics at the University of Minnesota, will speak on "The Essentials of Fresh Air" with illustrations by lantern slides Tuesday evening, May 6, during Health Week at the Minneapolis Armory. Ventilation in the modern home will be one of the features of Professor Stewart's address.

In an effort to increase the circulation of Hygeia a letter was recently sent to the secretary of each county society in Minnesota urging them to take up the matter of a Hygeia publicity committee with their local society. A county society can further the proper kind of medical publicity in no better way than taking a group subscription to Hygeia and placing Hygeia on the reception room table in each member's office.

The Samuel D. Gross prize of \$1,500 is offered this year for the best original essay illustrative of some subject in surgical, pathological or medical practice founded upon original investigations. The essay must be written by a single author in English and should be sent to the Trustees of the Samuel D. Gross Prize of the Philadelphia Academy of Surgeons, care of the College of Physicians, 19 South 22d Street, Philadelphia, on or before January 1, 1925. The competition is open to American citizens only.

The March number of MINNESOTA MEDICINE contained a short account of the Benjamin Franklin fund and the award to one Pierson W. Banning of Los Angeles of 2,500 pounds for his published work, "Mental and Spiritual Healing." Most of our readers are doubtless aware by now that the entire "story" was a hoax from start to finish, pulled off by the author, as he states, to win a bet. The whole story is rather interesting reading and is a good illustration of how publications credit the appearance of news items appearing in other publications.

In this instance the *London Times*, *British Medical Journal*, *New York Times*, and *Literary Digest* were all taken in. That the purpose of the ruse was to sell a worthless book seems apparent. The author, like the passer of a bogus check, seems to have imposed upon the general faith in human integrity, which is at the basis of all commercial and professional activities. The excuse given that this performance was a joke does not excuse a professional man for such a performance, and we hope our friend, Banning, obtained all the notoriety he sought.

At the meeting of the Administrative Board of the Medical School, University of Minnesota, April 10, 1924, the following nominations for medical school appointments were made: A. G. Mulder for the Shevlin Fellowship, serving in Physiology; Frank J. Heck as Teaching Fellow in Pathology, subject to the approval of the Graduate Medical Committee; Dr. Thorald E. Davidson, first year Teaching Fellow in Surgery, subject to the approval of the Graduate Medical Committee; Dr. M. N. Moss as Assistant in Obstetrics and Gynecology; Dr. David M. Siperstein as Assistant in Pediatrics; Dr. Kenneth H. Sutherland as Assistant in Preventive Medicine and Public Health; Dr. Laurence H. Cady as Assistant in Preventive Medicine and Public Health; Dr. Hewitt B. Hannah as Assistant in Nervous and Mental Diseases; Dr. Aaron Friedell as Assistant in Pediatrics; Jean C. Hawley, Bertha E. Rich, Ada M. Olsen, Eva H. Burggren and Antoinette A. Proshok as Assistants in Nursing; Corah V. Lund and Marion M. Stewart as Instructors in Nursing; Dr. Harry DeWitt Lees as Instructor in Preventive Medicine and Public Health; Dr. Reuben A. Johnson as Instructor in Medicine; Dr. George N. Ruhberg as Instructor in Neurology; Dr. H. S. Lippman as Instructor in Pediatrics.

The following appeal (translated from the "Berliner Tageblatt" for January 8, 1924) has been issued by a committee composed of the following, and other well-known members of the medical profession: Professors Bier, Bunnn, Czerny, His and Goldschneider:

"The appalling need, which all brain workers in Germany are experiencing, is being felt in an overwhelming measure by doctors. Large numbers of people are no longer calling in medical aid on account of their inability to pay the fees. This dwindling number of their patients has brought thousands of doctors to such a dire state of need that they have been obliged to seek other ways of earning a livelihood, and the majority of them are in a pitiable condition. Some have been driven to commit suicide. This need might be mitigated, if in the already-existing or planned community kitchens in Berlin, meals for doctors—'mensæ medicæ' could be established. For these meals they should pay a small sum of money, or in certain exceptionally unfortunate cases, they might be given free. Dr. Eugenie Schwarzwald has placed at our disposal the kitchens which were created and are conducted by the Austrian 'Friendly Help.' What is now wanted is money for carrying on the work in the kitchens and for buying the food. We appeal to everyone who has cause for gratitude to the medical profession to send contributions to the credit of the 'Friendly Help' (Dept. Mensæ Medicæ) to the Bank of Mendelssohn & Co., Berlin, W 8, Jagerstrasse 51; and by this means assist in maintaining the public health."

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

PARKE, DAVIS AND CO.:

Apothesine

Apothesine Solution

Apothesine Hypodermic Tablets 0.08 Gm. (1¼ Gr.)

Apothesine and Adrenalin Hypodermic Tablets

Apothesine and Adrenalin Hypodermic Tablets (R "B")

Apothesine and Adrenalin Hypodermic Tablets Cylindrical (for pressure anesthesia)

Apothesine Ointment

Pituitrin "S" (Surgical)

E. R. SQUIBB AND SONS:

Cod Liver Oil-Squibb

UNITED STATES STANDARD PRODUCTS CO.:

Acne Vaccine

Gonococcus Vaccine

Pertussis (Whooping Cough) Vaccine

Staphylococcus Combined Vaccine

Streptococcus Vaccine

Typhoid Vaccine

Typhoid Paratyphoid Vaccine Combined

Acne Vaccine Combined

Normal Horse Serum

Diphtheria Antitoxin, Refined and Concentrated

Diphtheria Toxin-Antitoxin Mixture (0.1 L +)

Diphtheria Toxin for Schick Test and Control

Tetanus Antitoxin

TRUTH ABOUT MEDICINES

NEW AND NON-OFFICIAL REMEDIES

Patch's Flavored Cod Liver Oil.—Cod liver oil containing 0.5 per cent of essential oils as flavoring, and having a vitamin potency so that 0.002 gm. per day is adequate to promote the growth of young albino rats. For discussion of the actions and uses of cod liver oil, see Useful Drugs. The dose is not more than 4 c.c. (1 fluidrachm) 3 times a day. For children not more than 2 c.c. (30 minims) 3 times a day. E. L. Patch Co., Boston.

Vitalait Culture Bacillus Acidophilus.—A pure culture of *Bacillus acidophilus* in vials each containing about 7 c.c. It contains not less than three hundred million of viable organisms (*B. acidophilus*) per cubic centimeter at the time of sale. For a discussion of the actions and uses of cultures of *B. acidophilus*, see Lactic Acid-Producing Organisms and Preparations, Jour. A. M. A., Sept. 8, 1923, p. 831. The usual dosage is the contents of one vial diluted with water and followed by a quantity of sugar of milk. The culture is distributed by the manufacturer only and is sent by mail. The Vitalait Laboratory of California, Pasadena, Calif. (Jour. A. M. A., March 1, p. 717.)

Apothesine. — Diethyl-amino-propyl cinnamate-hydrochloride. Apothesine is a local anesthetic of the procaine rather than the cocaine type, that is, it belongs to that type which,

while effective for injection anesthesia (especially when combined with epinephrine), is relatively inefficient when applied to mucous membranes. It is rather slower in action than procaine. Its absolute toxicity is less than that of cocaine, but about twice that of procaine. It is employed for infiltration injection, nerve blocking, intraspinal injection, pressure anesthesia, oral administration as a palliative measure, for post-operative and persistent vomiting and pain of gastric ulcer. As a local anesthetic, apothesine is used in 0.5 to 2 per cent solution, generally with epinephrine and sterile water or physiological solution of sodium chloride. Apothesine is marketed in substance and also in the following forms: Apothesine solution 1.5 per cent; apothesine hypodermic tablets 0.08 gm.; apothesine and adrenalin hypodermic tablets (apothesine 0.04 gm.; adrenalin 0.00004 gm.); apothesine and adrenalin hypodermic tablets (apothesine 0.3 gm.; adrenalin 0.00003 gm.); apothesine and adrenalin hypodermic tablets cylindrical (apothesine 0.01 gm.; adrenalin 0.000025 gm.); apothesine ointment (apothesine 10 per cent; adrenalin 1:60,000, and menthol 0.5 per cent). Parke, Davis and Co., Detroit. (Jour. A. M. A., March 8, 1924, p. 793.)

Butesin Picrate. — Trinormalbutylparaminobenzoatedinitrophenal.—A compound consisting of one molecule of trinitrophenol (picric acid) and three molecules of normal butyl ester of 4-aminobenzoic acid. Butesin picrate combines the anesthetic action of butesin with the antiseptic properties of trinitrophenol (picric acid). An aqueous solution of 1:1,400 produces immediate and complete anesthesia of the eye, which lasts from ten to twenty minutes. Butesin picrate is used in the treatment of burns, ulcers and other denuded, painful lesions of the skin. For use, a 1 per cent butesin ointment is supplied by the manufacturer. The Abbott Laboratories, Chicago.

Normal Horse Serum.—A normal horse serum (see New and Non-official Remedies, 1923, p. 281) marketed in packages of one syringe containing 10 c.c.; also in packages of one syringe containing 20 c.c. United States Standard Products Co., Woodworth, Wis. (Jour. A. M. A., March 15, 1924, p. 876.)

Dibromin.—Dibromobarbituric acid.—Dibromin is an antiseptic and germicide proposed for use in solution as an irrigating fluid and wet dressings, for flushing cavities, irrigating infected wounds and for saturating gauze packings. Dibromin is claimed to be practically free from irritating or toxic properties in the concentrations required for therapeutic use. Solutions of 1:10,000 (6 grains to one gallon) or stronger are used. Dibromin is marketed in six grain capsules. Parke, Davis and Co., Detroit.

Acne Vaccine.—An acne vaccine (see New and Non-official Remedies, 1923, p. 302) marketed in packages of one 10 c.c. vial, each c.c. containing 40 million killed bacteria. United States Standard Products Co., Woodworth, Wis.

Gonococcus Vaccine.—A gonococcus vaccine (see New and Non-official Remedies, 1923, p. 304) marketed in packages of one 10 c.c. vial, each c.c. containing 1,000 million killed gonococci. United States Standard Products Co., Woodworth, Wis.

Pertussis (Whooping Cough) Vaccine.—A pertussis bacillus vaccine (see New and Non-official Remedies, 1923, p. 306) marketed in packages of one 10 c.c. vial, each c.c. containing 3,000 million killed pertussis bacilli. United States Standard Products Co., Woodworth, Wis.

Typhoid Vaccine.—A typhoid vaccine (see New and Non-official Remedies, 1923, p. 314) marketed in packages of three 1 c.c. vials, containing 500 million, 1,000 million and 1,000 million killed typhoid bacteria, respectively. United States Standard Products Co., Woodworth, Wis.

Typhoid Paratyphoid Vaccine (Combined).—A typhoid vaccine (see New and Non-official Remedies, 1923, p. 314) marketed in packages of three 1 c.c. vials, the first dose containing 500 million killed typhoid bacteria, 375 million killed paratyphoid A and 375 million killed paratyphoid B bacteria, the second and third doses each containing 1,000 million killed typhoid bacteria, 750 million killed paratyphoid A bacteria and 750 million killed paratyphoid B bacteria. United States Standard Products Co., Woodworth, Wis. (Jour. A. M. A., March 22, 1924, p. 967.)

Staphylococcus Combined Vaccine.—A staphylococcus vaccine (see New and Non-official Remedies, 1923, p. 310) marketed in packages of one 10 c.c. vial, each c.c. containing 1,000 million killed staphylococcus albus and 1,000 million killed staphylococcus aureus. United States Standard Products Co., Woodworth, Wis.

Streptococcus Vaccine.—A streptococcus vaccine (see New and Non-official Remedies, 1923, p. 312) marketed in packages of one 10 c.c. vial, each c.c. containing 400 million killed streptococci. United States Standard Products Co., Woodworth, Wis.

Acne Vaccine Combined.—A mixed bacterial vaccine (see New and Non-official Remedies, 1923, p. 318) marketed in packages containing one 10 c.c. vial, each c.c. containing 40 million killed acne bacilli and 1,000 million killed staphylococcus albus. United States Standard Products Co., Woodworth, Wis.

Diphtheria Antitoxin, Refined and Concentrated.—A refined and concentrated diphtheria antitoxin (see New and Non-official Remedies, 1923, p. 283) prepared according to a modification of Banzhaf's method, marketed in syringes containing 1,000, 3,000, 5,000, 10,000 and 20,000 units, respectively. United States Standard Products Co., Woodworth, Wis.

Diphtheria Toxin-Antitoxin Mixture, 0.1 L +.—A diphtheria toxin-antitoxin mixture (see New and Non-official Remedies, 1923, p. 284) each c.c. constituting a single dose and marketed in packages of 3 vials, each containing 1 c.c.; in packages of 30 vials, each containing 1 c.c.; and in packages of one vial containing 30 c.c. United States Standard Products Co., Woodworth, Wis.

Diphtheria Toxin for Shick Test and Control.—A diphtheria immunity test (see New and Non-official Remedies, 1923, p. 323) marketed in packages containing a vial with undiluted diphtheria toxin and physiological solution of sodium chloride for dilution. As a means of control there is also supplied diphtheria toxin which has been heated to destroy the exotoxins. The product is marketed in pack-

ages containing an amount sufficient for fifty tests; also in packages containing an amount sufficient for one hundred tests, but the strength of the toxin is such that the dose is 0.1 c.c. United States Standard Products Co., Woodworth, Wis.

Tetanus Antitoxin.—A concentrated tetanus antitoxin (see New and Non-official Remedies, 1923, p. 284) prepared according to the Banzhaf method. Marketed in syringes containing 1,500, 5,000 and 10,000 units. United States Standard Products Co., Woodworth, Wis. (Jour. A. M. A., March 29, 1924, p. 1047.)

PROPAGANDA FOR REFORM

Citrophan.—This is a "fat cure" exploited to the medical profession and the public by the Gotham Corporation, New York City. The only statement bearing on the identity of Citrophan which is made is the claim that it is "a new organic iodine compound." The claims made for Citrophan are many and various; back of all of them is the fundamental thesis: "Science has found that the chief cause of obesity lies in the development of alcohol in the digestive tract brought about by the action of yeast bacteria—taken into the stomach in improperly baked bread—and on raw fruits and vegetables." This claim is unsupported by scientific work. The A. M. A. Chemical Laboratory reports that Citrophan is sold in the form of tablets ranging in weight from about 4½ grains to more than 7 grains. Analysis indicated that the chief medicinal ingredient was tetraiodophenolphthalein. Sugar of milk, starch, vegetable tissue and traces of an acid-insoluble substance (probably talc) were found; also two per cent of an unidentified organic substance. Quantitative determinations showed the composition of Citrophan to be: tetraiodophenolphthalein 40 per cent, sugar of milk 52 per cent, ash (including talc) 3 per cent, starch and undetermined 5 per cent. About twenty-five years ago, tetraiodophenolphthalein, the chief medicinal ingredient of Citrophan, was exploited under the name "nosophen" as an external and internal antiseptic. It has never attracted much attention in this country. Fangerine is sold (in the form of tablets) along with Citrophan. This the A. M. A. Chemical Laboratory found to contain phenolphthalein as its medicinal ingredient. It is evident that Citrophan is not a new discovery as claimed, and there is no evidence that Citrophan will reduce weight, except perhaps by disturbing the digestive functions. (Jour. A. M. A., March 1, 1924, p. 734.)

Mistura Creosote Comp. (Killgore's) and Tablets Cascara Comp. (Killgore's).—The Council on Pharmacy and Chemistry reports that these products were found unacceptable for New and Non-official Remedies. Mistura Creosote Comp. (Killgore's) is marketed with the claim that each teaspoonful contains two minims of creosote "combined with Tonic Aromatics," but the identity and amount of the "Tonic Aromatics" is not declared. The Council declared the preparation in conflict with the rules that govern the acceptance of articles in that it is a mixture of semisecret composition which is marketed with unwarranted therapeutic claims and in a way that may lead the public to depend on it for the self-treatment of serious diseases. Tablets Cascara Comp. (Killgore's) are said to have the

following composition: "Ext. Cascara 2 grs.; Podophyllin $\frac{1}{8}$ gr.; Ext. Belladonna $\frac{1}{8}$ gr." The tablets were found in conflict with the rules that govern the acceptance of articles. The product is marketed under a name which is not descriptive of its composition in that the name indicates that it is a cascara preparation, yet the most active constituent is resin of podophyllum; the product is marketed with unwarranted therapeutic claims and the composition of the tablets is unscientific because there is no evidence that a therapeutic dose of extract of belladonna is useful with a suitable dose of resin of podophyllum or of extract of cascara sagrada. (Jour. A. M. A., March 8, 1924, p. 812.)

Sodium Morrhuate in Tuberculosis.—Sodium morrhuate is the sodium compound (soap) of the fatty acids obtained from cod liver oil. Its use in tuberculosis has been advocated, but like other preparations proposed for the treatment of this disease, it has not been shown to have value. The reported trials make its lack of value probable. Sodium morrhuate has not been admitted to New and Non-official Remedies. (Jour. A. M. A., 1924, p. 813.)

The Rectal Administration of Arsphenamin.—The intravenous administration of arsphenamin requires some skill, especially in children and in the obese in whom the veins are not readily accessible. Attempts have been made, therefore, to develop other methods of securing the effects of the drug. Among these, rectal administration has found most advocates. Manufacturers, ever seeking novelties, have used favorable reports to market suppositories of arsphenamin. In 1920, the Council on Pharmacy and Chemistry published a report on supsalsves stating that the evidence for the rectal administration of arsphenamin was distinctly unfavorable. At present the medical profession is being circularized by the Swan-Myer Company in an endeavor to popularize the rectal administration of arsphenamin in the form of suppositories sold as arsphenoids. It is opportune, therefore, that Littman and Hutton, at the request of the Therapeutic Research Committee of the Council on Pharmacy and Chemistry, present a critical review of the literature and the result of clinical trials of the rectal use of arsphenamin. Since most advocates of the rectal administration of arsphenamin stress its importance in the case of infants, the investigators carried out their study with children with active symptoms of congenital syphilis. They used arsphenamin given by enteroclysis and also the supsalsves suppositories. The authors conclude that the clinical results were too feeble as compared with the intravenous or intramuscular method to warrant favorable consideration of the rectal administration. The investigators hold, moreover, that neoarsphenamin and sulpharsphenamin are now generally used by the intramuscular route in the treatment of syphilis in infants with results that are above reproach. (Jour. A. M. A., March 15, 1924, p. 888.)

"Vita-Pep."—Vita-Pep is nominally put on the market by the Vitamine Products Co., of New York City, but actually seems to be put out by the Vitamin Food Co., Inc., of Westfield, Mass. The president of the Vitamin Food Co. is one Eugene Christian, who calls himself a food specialist. He has offered a "Course in Scientific Eating" in which

he showed his monumental ignorance of the subject he wanted to teach. Later, he was interested in an obesity treatment, the "Vaco Reducing Cup." Then he tried to sell oil stock to those on the sucker list. Then came the Vitamin Food Co., Inc., with Christian as president, and those on the sucker list were asked to buy stock in this company. In the earlier advertising, the product mainly stressed was "Vegex," which, according to the advertising matter, was a name that the Vitamin Food Co., Inc., had given to a British preparation sold across the water as "Marmite." Now comes the crowning achievement of the Vitamin Food Co., Inc., Vita-Pep. The circular for this contained the statement in large letters that the preparation contains alcohol 16 per cent. According to the label, Vita-Pep, in addition to containing wine with an alcohol strength of 16 per cent, also contains pepsin, rennin and a concentrate of vitamin "B." The advertising circular states that Vita-Pep is a "Zestful New Health Tonic" which "Restores Youthful Vitality." According to the advertising, "Vita-Pep is pleasant to the taste and delightful in its effect—takes away that tired, rundown feeling and makes one feel vigorous, healthy and strong." What is the United States Revenue Department going to do about it? (Jour. A. M. A., March 15, 1924, p. 907.)

Fat-Free Tincture of Digitalis.—Roth found that fat-free tinctures of digitalis had no advantages over the U. S. P. tincture of digitalis. On the contrary, he found some of these fat-free tinctures were so unstable that he advised manufacturers not to market them without stating the date of their manufacture on the label. "Fat-free" tincture of digitalis was introduced under the belief that the fat from the leaf produced gastric disturbance; but Hatcher and Eggleston fed the fat to cats and found that it had no emetic action whatever. After an investigation of the subject, the Council on Pharmacy and Chemistry concluded that there is no essential difference in action between "fat-free" tinctures of digitalis and the product official in the U. S. Pharmacopeia. (Jour. A. M. A., March 16, 1924, p. 911.)

Digifolin.—The claim is made for Digifolin that it keeps indefinitely. The available scientific evidence indicates that all digitalis preparations deteriorate with age. (Jour. A. M. A., March 15, 1924, p. 911.)

Canine Rabies Virus.—Results of the single injection method against rabies in dogs have been reported from different sources. The U. S. Bureau of Animal Industry has been conducting experimental work on this subject and results indicate that the prophylactic vaccination has value which, however, is determined to a certain extent by the virus to which the animal is exposed. The use of the single injection vaccine in animals that have been bitten is believed to be unwarranted at this time. The Högyes treatment of six doses, in animals bitten, has been used successfully for some time and the failures reported have been small. The use of the Högyes vaccine together with the cauterization of the wound and the placing of the animal in quarantine for six months to a year seems to be the best method of treating such cases. (Jour. A. M. A., March 29, 1924, p. 1066.)

Allonal-Roche.—Allonal (The Hoffmann-La Roche Chemical Works, New York) is "Allylisopropylbarbituric acid-Phenyl-dimethyl dimethylamino pyrazolon." In the literature first sent out, it was stated to be a "compound" made by "chemically uniting allyl-isopropylbarbituric acid (37.5%) with phenyl di-methyl-dimethylamino-pyrazolon (52.5%) amidopyrin, i. e., in molecular proportions 1:2." Examination of Allonal tablets made in the A. M. A. Chemical Laboratory last year showed that, in water, the substance behaved as a mixture of allyl-isopropyl barbituric acid and amidopyrin and not as a compound. Furthermore, the percentages of the ingredients given were not in accord with the statement that they were in molecular proportions. The published reports on its use are favorable, but they apparently include no observations with controls. The evidence thus far available does not seem to prove (1) that "Allonal" possesses advantage over a mixture of allyl-isopropyl barbituric acid and amidopyrin, or even over one or other of its ingredients alone; (2) that the administration of allyl-isopropyl barbituric acid and amidopyrin in fixed proportion is desirable. The product has not been accepted for New and Non-official Remedies. (Jour. A. M. A., March 29, p. 1066.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

MEETING OF MARCH 12, 1924

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, March 12, 1924, at 8 p. m. The meeting was called to order by the President, Dr. Hamilton. There were 34 members and three visitors present.

The minutes of the February meeting were read and approved.

Dr. S. E. Sweitzer was elected to membership in the Academy.

The following members reported cases:

1. DR. E. M. HAMMES (St. Paul) reported three cases.

Case 1. Male, 19 years old, single, seen in consultation with Dr. Knox Bacon, Nov. 1, 1923. Family and personal history were negative. Present complaint began about October 10, 1923, with frontal headache. A few days later patient became nauseated with occasional expulsive vomiting. About Nov. 1st the family noticed that he had some difficulty in finding correct words while carrying on a conversation. At the same time he complained of vertigo on standing and of some impaired vision. In the course of a conversation he would stop abruptly in the middle of a sentence and forget to finish it. After being kept in bed for a week he seemed brighter and his headache was not as intense. He had an occasional degree of temperature. Pulse 80. Neurological examination at this time was negative except that he had bilateral choked discs, a slightly positive Romberg, and some mental confusion. His reflexes were normal. All laboratory findings, including spinal fluid examination, were negative except for a leuco-

cytosis of 12,000. I saw him again in consultation with Dr. Hoffman, November 15th. His condition was about the same but it was found that his choked discs were more pronounced; that he had right homonymous hemianopsia; some ataxia of the left arm; increased right knee-jerk; absent left abdominal reflex; slight tenderness in occipital region. X-ray of skull was negative. A diagnosis of left occipital lobe tumor was made. He went to Philadelphia and rapidly grew worse. Dr. Frazier suspected a possible occipital abscess and introduced a trocar into the occipital lobe, with negative findings. A bone-flap operation over the left occipital area revealed no definite pathology but Dr. Frazier thought that he probably had an infiltrating glioma of the left occipital lobe. He died three days later. No post-mortem was permitted.

Case 2. Female, aged 21, single, seen in consultation with Dr. A. Conley, of Cannon Falls, Minnesota. June 24, 1923.

Family and personal history negative. Patient states that during April, 1923, she developed headaches of short duration which gradually became more frequent and more severe. About one month later she had an occasional dizzy spell, especially when she became fatigued, and during the latter part of May she had three attacks of emesis in the early morning. About this time her headaches were relieved somewhat by getting glasses, but became more pronounced a week later. On June 19th her pulse was 75; on June 21st it was 50; on June 23rd it was 40 per minute, and on arrival at the hospital on June 24th her pulse was 36. She stood the trip (forty miles by auto) well.

Her neurological examination was negative except for slight rigidity of the neck muscles, which was probably voluntary, because of excruciating headache; an irregular nystagmoid movement of the eyeballs to the right; sluggish right superficial reflexes; a positive Kernig and absent kneejerks, and a beginning optic neuritis. A lumbar puncture was performed and about 35 c.c. of clear spinal fluid under pressure were removed. This gave some relief of her headache and her pulse went up to 48. The spinal fluid showed the following: Fibrin web on standing; 24 lymphocytes per cu. mm., a positive globulin, a negative Wassermann, and negative colloidal gold curve. No tubercle bacilli or other bacteria were found. A tentative diagnosis of tubercular meningitis or epidemic encephalitis was made. Her temperature was normal; her pulse varied between 36 and 70. With daily lumbar punctures, her headaches were relieved and she improved somewhat. However, on July 1st, she suddenly developed respiratory paralysis and died.

Post-mortem examination of the brain by Dr. J. C. McKinley revealed an internal hydrocephalus, and a tumor mass about 3.5 cm. in diameter entirely occluding the 4th ventricle. The tumor proved to be a sarcoma, probably arising from the choroid plexus. There were a few meningeal metastases but no pathology was found in the other organs.

Case 3. Female, aged 58, married. Seen in consultation with Dr. C. Bell, of St. Paul, October 30, 1923.

Her family history was negative; her past history was negative except that she had a carcinoma of the left breast removed in 1921 by Dr. Judd, of Rochester. About eight

months ago, she developed some pains in her back and in both legs, especially left ankle, which were thought to be rheumatic. About six months ago she noticed a small lump over the parietal region of her skull—painless and not tender. This grew quite rapidly but caused no inconvenience except that it was an annoyance when she combed her hair. By October it was about the size and shape of half of a hen's egg. October 30th she suddenly developed a generalized convulsion and when I saw her, half an hour later, she was quite confused but able to answer questions.

Neurological examination was negative throughout. During the night she had two more convulsions and the next day her right hand was weak and awkward. Her condition has slowly progressed during the past month. She furthermore has definite tenderness over the 4th and 5th lumbar vertebrae. An x-ray of the skull revealed multiple areas of bone destruction, probably carcinomatous metastasis. X-ray of left angle was negative.

2. DR. H. P. RITCHIE reported a case of Vesico-Diverticulo-Rectal Fistula.

Mr. C. E. B., aged 63, consulted Dr. A. MacLaren on February 12, 1923.

History: Fifteen years ago began to have frequency of urination; up three or four times at night for several years. Five years ago supposed to have had a prostatic abscess which discharged through rectum, followed by a urinary fistula. During this time several examinations were made and carcinoma of the prostate diagnosed by two reliable men. The fistula closed after three months. He has been able to do his work until a few months ago, when fistula returned.

Present complaint: Evacuation of urine every two hours per rectum. Small quantity of urine per urethram after great exertion. Patient losing weight with general physical lassitude.

Cystoscopy, made by Dr. Paul Cook, showed a suppurative cystitis. At right base of bladder was a large diverticulum, so placed as to be in line with the ureter. The right ureter could not be found. The left was catheterized to find pus urine but a competent kidney. There was little, if any, enlargement of the prostate.

Operation: The general conditions were most unfavorable for operative procedures, but the distressing state of the patient led him to assume all risks so Dr. MacLaren asked me to make the attempt at closure. From Dr. Cook's report it seemed necessary to locate the right ureter, so I cystoscoped him before attacking him from above, but was unable to find the meatus, nor at any time during the operation was the ureter seen. The extraordinary cystitis led me to attempt an extra-vesicle demonstration of the diverticulum, but such was the thickness and friability of the wall that the peritoneum was opened in two places before I desisted from this plan. The bladder was then opened, and the side wall bisected to and into the diverticulum. The fear was of making a large opening into the rectum, as it was natural to suppose that it was closely adherent to the pouch, but to the surprise and relief of Dr. Daugherty and myself a line of cleavage was readily shown so that the diverticulum was peeled off, like a skin from an orange, down to a point where we could see, by means of a head-

light and constant use of the aspirator, the fistulous track about one-fourth inch in diameter. This was clamped by forceps and tied, the sac removed, the wall of the bladder repaired, and drainage extra- and intra-vesicular instituted. As before stated, the meatus or ureter was never seen and from the location of the pouch and the extent of the dissection, it must have been involved. But so far as we could see there were no signs of kidney obstruction at any time.

The convalescence was stormy, caused by the most extreme sepsis of the wound, resulting from the great infection of the bladder, macroscopically due to the colon bacillus. The mercurochrome, now so widely advertised, seemed to give the best results in irrigating him.

After six weeks of trying time he recovered and within the past few months reports the fistula has remained closed but that frequency still is present. Occasionally there is some leak from the suprapubic wound. But the general condition is so improved as to be satisfactory to all concerned.

It would be hard to conceive of this situation occurring in a woman. It must be a most rare situation, but the possibility of its occurrence may make it worth recording.

3. DR. G. SCHWYZER (Minneapolis) reported a case of Adeno-Carcinoma of an Accessory Thyroid.

A fifty-four-year-old woman consulted us in the first week of January, 1924, for a tumor on the right side of her neck below the jaw.

There is an extensive scar in the region of the clavicles and upper end of sternum indicating a collar incision. We learn from the patient that she had a goiter operation three years previously. Following that operation she was hoarse, though her voice improved gradually but never completely. Six months following this goiter operation the present tumor made its first appearance in the size of a walnut, and it has gradually grown to the present size, that of a fist. The main distress through the tumor lies in the difficulty in swallowing food. The latter goes, as she says, to a certain point in her throat and only by a special effort is the food pressed farther down.

The rather well-nourished woman has not lost any weight, weighs at present 153 pounds, feels fairly strong and is able to do heavy work like washing and so on.

The tumor on the side of her neck is about four inches long and two inches in diameter vertically. The covering skin is normal, the consistency is generally soft elastic, partly fluctuating. It can be moved in a vertical sense, but not horizontally.

Laryngoscopically we find, and this has been confirmed by the laryngologist, an unusual picture. A tumor of the size of a plum bulges out into the pharynx below the tonsil and obstructs greatly the laryngoscopical picture. Only the left vocal cord is visible, and this appears paretic. Palpating this tumorous projection in the pharynx we are convinced that we have to do with the same growth that exists on the outside. We even state a feeling of fluctuation between inner and outer part of the tumor. The mucous lining covering the pharynx is normal. There are no pains by palpation.

Our diagnosis was a branchial tumor, partially cystic.

We operated January 10th under local anesthesia. We used 100 c.c. of 0.5 per cent novocaine solution. Anesthesia was done after Braun—prevertebral injection and blocking of the nerves around the tumor. Generally speaking the anesthesia was efficient. The operation was exceedingly difficult and involved unusual anatomical dissection. The nervus hypoglossus with its descending branches and the common carotid had to be dissected free from the tumor. The latter ran over the posterior part of the tumor but anteriorly. Inferiorly scar tissue made blunt dissection impossible. Posteriorly to the tumor lies the vertebral column, and between the two our hand tries to reach toward the pharynx. We are succeeding in peeling out the tumor away from the mucous lining of the pharynx, though the pharyngeal mucous lining tears in one place in a distance of about a half an inch. This rent is immediately sutured with chromic catgut. The wound is then closed and well drained.

Four hours after the operation the patient presents the picture of novocaine poisoning. She is stuporous, cyanosed in the face, has blue finger nails and an irregular pulse of only 70, breathing normal. We give 700 c.c. saline solution intravenously together with calcium chloride given by rectum in repeated doses so that she had about 8 grams that night. Sensorium becomes clear the next morning. She appears rather nervous. Continuous proctocleisis is given in order to avoid deglutition.

On the third day patient takes nourishments. On the fourth day foul breath is noticed. Patient becomes unmanageable, talks irrationally, gives the picture of persecution insanity, has to be isolated and restrained. The wound of neck discharges some infected secretion. Thorough disinfection—Di-chloramin-T used. We are probing the wound to see whether we have any communication between outer wound and pharynx. We are unable to feel the probe on the inside.

On the fifth day patient is comatose with a strong regular pulse of 120. She cannot be aroused any more and succumbed the morning of the sixth day following the operation.

The pathologist, Dr. E. T. Bell, reports that sections from tissue of the tumor show adeno-carcinoma of an accessory thyroid.

The case presents interesting features not only diagnostically and pathologically, but also post-operatively, on account of symptoms following local anesthesia. As I mentioned before, we used 100 c.c. of 0.5 per cent novocaine solution. In German literature I read of calcium chloride being given as an antidote for novocaine poisoning. It was rather astonishing to find the patient with a clear sensorium the next morning.

The question arose as to what this woman died from. The nearest reason we could think of was from infection due to the rent in the pharynx. In our estimation that rent opened up the day we noticed the foul breath. In regard to the psychical changes a thought of explanation came to us through the pathological report which told us that we had to do with an accessory thyroid. The other pathologist who examined the specimen thought he found tissue indicating hyperthyroidism. Clinically, however, the pa-

tient did not present any such symptoms previous to operation.

DISCUSSION

DR. FARR: I have had no experience with novocain poisoning because I have never seen anything more than slight manifestations of its toxicity. I would like to ask Dr. Schwyzer upon what he bases his diagnosis of novocain poisoning. When novocain comes in contact with the nerve cells and acts upon them the resulting substance formed is passive and innocuous. Toxic symptoms arise from the contact of novocain with the central nervous system. Considering my own experience, and just having completed the reading of Dr. Braun's book in which he goes into the question of toxicity extensively, I cannot believe that the symptoms given by Dr. Schwyzer are an evidence of novocain poisoning.

Poisoning as late as this does not occur, as far as I know. When the toxic dose is given symptoms appear immediately. I would, therefore, question symptoms coming on four hours after operation being due to novocain.

I have, in a few instances, accidentally injected a small amount of novocain solution directly into an artery or vein under circumstances which permitted the solution to be carried to the central nervous system. The symptoms were always acute and immediate. The patient develops a bursting headache, becomes pale, the pupils dilate, nausea and vomiting appear, and in case a lethal dose is given convulsions appear.

I have had a case of cocain death. The patient developed convulsions and a paralysis of respiration. The heart continued to beat for one hour and five minutes under artificial respiration. In this case we supposed we were using novocain. It would take more evidence than Dr. Schwyzer has given to convince me that the case he reported was one of novocain poisoning, and I believe we should be extremely careful in checking up such cases so that the actual toxicity of novocain may become known.

DR. G. SCHWYZER: In answer to Dr. Farr's remarks, I would like to say that the poisoning certainly followed the operation immediately, though I did not observe the patient for two to three hours directly after the operation. Still I positively know that four hours after the operation the patient was completely stuporous, could only be aroused by our shaking her and she was cyanosed at that time, her finger nails were black, and her former strong pulse weakened, decreased to only 70 and became very irregular. Of what other condition than of the poisoning through the local anesthetic could we think, when on the following morning we found the patient entirely clear, having a good expression, a free sensorium, and a strong pulse of 100?

4. DR. GEO. DOUGLAS LEAD reported a Case of Primary Tuberculosis of the Spleen with Polycythemia and Splenomegaly. Treated with Radium and Benzol.

The following case is reported to the Society because of its scientific importance and the long interval of time—nearly six and a half years—during which the patient was observed under treatment with radium and benzol.

SUMMARY OF CASE REPORT

Mrs. Van., American, age forty-nine. Married, four children, two living. First examination January 26, 1917.

Mother died of cancer of the stomach. One sister died of cancer of the uterus. Patient was said to have had "water diabetes" at three years of age. Had typhoid fever at eighteen years of age. Operated upon for appendicitis six years ago. For five or six years patient has occasionally taken antkamnia for headaches. Had menopause at forty-three years.

Patient's present illness dated back three years from the time of the primary examination. She complained of a feeling of tightness in the epigastrium, with excessive salivation and occasional vomiting spells. At first the attacks came only about once a month but increased in frequency and she has had as many as three a day, especially when under nervous strain. At that time patient also had dizzy spells and tired easily. Was bothered with morning headaches and attacks of epistaxis. Had lost in weight eighteen pounds. Never vomited blood. Redness of her face became noticeable two years before the primary examination. This was more marked under exertion.

Patient was a short, slim woman with light hair and eyes. One was struck at once by the deep red color of patient's skin and mucous membranes. The face, forehead and neck showed a high, dark red, while the fingers were red with a bluish tinge. The lips and alæ of the nose were a bluish tinge. The tongue was red with dilated veins on its under surface. The back of the throat was congested and covered with dilated venules. The inside of the lips and cheeks showed a dark red congested appearance. The eyes looked inflamed. The lids were red with prominent blood vessels over the sclera.

Careful physical examination was negative for organic disease outside of the enlarged spleen, the polycythemia, and the hypertension. The spleen could be felt two fingers' breadth below the costal margin. The surface was smooth, its edge hard and firm. The blood examination was as follows: Hemoglobin 140 per cent, R. B. C. 8,760,000, W. B. C. 13,500. Differential count: P. M. N. 77.0, Large monos. 4.0, Lympho. 12.5, Trans. 3.0, Eosin. 3.0, Basophiles 0.5, Myelocytes 0.0. The R. B. C. appeared normal in the stained smear. The blood pressure was 208 systolic and 110 diastolic. The von Pirquet tuberculin test was strongly positive. A test for the fragility of the red blood cells was normal. Phenolsulphonephthalein test was normal. Occult blood test for stools was negative. She gave a strong positive reaction to the subcutaneous tuberculin test.

All other findings being negative, a diagnosis of tuberculosis of the spleen, with polycythemia and hypertension, was made. The splenic area was exposed to 90 mgms. of radium on two successive days and patient was placed on benzol, five grains three times a day. Blood examination made seven weeks following the radium exposure was as follows: hemoglobin 110 per cent, R. B. C. 8,650,000, W. B. C. 7,300. Differential count: P. M. N. 81.0, Large monos. 1.0, Lympho. 16.5, Trans. 0.0, Eosino. 1.5, Baso. 0.0, Myelo. 0.0. Patient's color was much improved. Blood pressure was 130 systolic, 90 diastolic. Spleen was not palpable and was diminished in size to percussion. She had gained in weight but had had a hemorrhage from the bowels of one cup of blood five weeks prior to this examination.

Six months later patient was again examined. The blood

examination showed marked improvement—hemoglobin 105 per cent, R. B. C. 6,230,000, W. B. C. 12,800. Differential count: P. M. N. 75.5, Large monos. 3.0, Lympho. 15.0, Trans. 2.5, Eosino. 0.0, Baso. 0.0, Myelo. 0.0. The blood pressure was 148 systolic, 88 diastolic.

In November, 1919, about three years after coming under observation, patient was again examined. Her color was nearly normal. The spleen was not palpable at the costal margin. She had taken benzol from time to time. The blood examination showed the hemoglobin 110 per cent, R. B. C. 6,975,000, W. B. C. 10,750. Blood pressure was 136 systolic, 82 diastolic.

In April, 1920, patient returned again for bleeding of the gums when she cleaned her teeth. Blood examination showed more polycythemia—hemoglobin 125 per cent, R. B. C. 7,360,000. A second series of radium exposures of the spleen was made and patient was advised to again take benzol. Six months after the second radium treatment, the blood showed marked improvement and was as follows: Hemoglobin 100 per cent, R. B. C. 5,680,000, W. B. C. 17,000. Differential count: P. M. N. 79.0, Lympho. 11.0, Large monos. 5.0, Trans. 2.0, Eosino. 1.0, Baso. 2.0.

In May, 1921, patient was again examined, as she was feeling much worse. The color of her face was a dark, suffused red, the conjunctivæ very much injected and red. Her hands were a dark, bluish red color. The spleen, however, could not be palpated below the costal margin. Blood pressure was 175 systolic, 90 diastolic. The blood examination showed the hemoglobin 125 per cent, R. B. C. 7,760,000, W. B. C. 14,000. Patient was again placed upon benzol but made no improvement in the blood; in July, 1922, the blood examination being worse—hemoglobin 133 per cent, R. B. C. 9,190,000, W. B. C. 18,300.

Radium over the spleen was again used, 100 mgms. for eight hours being given. Patient improved symptomatically but no blood examination was made prior to September, 1923, when she returned again in another exacerbation, with a hemoglobin of 150 per cent, red cells 8,112,000, leucocytes 18,250. Radium 100 mgms. over an eight hour period was again used over the splenic area. No examinations of the blood have been made following the last radium treatment.

DISCUSSION

DR. ULRICH: I listened with great interest and some astonishment to the reading of this case, that is, a case of polycythemia associated with tuberculosis of the spleen. It has always been our assumption that tuberculosis of the spleen produces a profound anemia. Cirrhosis of the liver occasionally is associated with polycythemia but I have never heard of polycythemia associated with primary tuberculosis of the spleen. Primary tuberculosis of the spleen is exceedingly rare and the diagnosis can only be made with accuracy at the post-mortem or on biopsy. I do not think in this report that one can make a diagnosis of tuberculosis of the spleen by a von Pirquet reaction and subcutaneous tuberculin reaction. The cure of primary tuberculosis of the spleen is splenectomy.

DR. CROSS: I would like to ask Dr. Head whether the same clinical improvement followed the last use of radium, as it did in the other applications of it.

DR. MANN: I do not know very much about radium, but I would like to ask a question. As I understand it, the distance through which radium is effective is about 2 cm., when the hard rays are screened off, so in this case it could not shine into the spleen very far even if it could reach the spleen. Of course this patient was a slender woman. In that case, I would like to ask Dr. Head why he could not get a much better effect from x-ray, especially deep x-ray which would shine all the way through, if he did not want the spleen taken out.

DR. A. SCHWYZER: The hardest gamma rays are more penetrating than the hottest x-ray. It will penetrate 26½ cm. very well and go even through the body in a very large spleen. Radium will surely work. The filtering must be pretty strong. I remember a case I had in which we filtered through 1 mm. of brass, 0.5 mm. of silver, and in addition 2 mm. of lead. Of course lead gives strong beta rays and you have to use rubber over it. This spleen went down to one-third before we operated.

DR. HEAD (in closing): I can only say in answer to Dr. Mann's suggestion with relation to the penetration of radium, that the spleen diminished in size after the use of radium and the clinical evidence was very clear that the use of the radium had considerable to do with it. One of the interesting features about this case is that we did not apply it once but repeated the radium on three successive occasions, and to me that is fairly good evidence that it was the radium which produced the favorable outcome.

In answer to Dr. Cross' question, the last exposure has been too recent to determine whether or not it will be of any real benefit. In the next to the last exposure I do not think we got as profound an effect. At the present time the patient's blood is as polycythemic as at any time.

I was in hopes that in the discussion the natural exacerbations of the disease might be brought out. That is, do the cases, like pernicious anemia, run courses with exacerbations and remissions when left to themselves? In the literature one finds very few reports of cases of polycythemia that have been followed over any long period of years to determine just the course which they pursue, uninfluenced by drugs or other management. Osler had cases reported over a number of years.

In answer to Dr. Ulrich's expressed doubt relative to the etiological relationship between tuberculosis and polycythemia: If I remember correctly, one of the first cases on record was proven at autopsy to be tuberculosis of the spleen. In Weber's monograph on polycythemia, the detailed report of the authentic cases which he presents reveals tuberculosis as a prominent pathological factor in the history of the cases and the autopsy findings. Tuberculosis of the spleen has been established by numerous case reports as associated with polycythemia and splenomegaly. I think if Dr. Ulrich will read Weber's and Winternitz's studies, he will change his notions regarding the independence of tuberculosis of the spleen and polycythemia.

Of course I do not want to contend that the subcutaneous tuberculin test, or a positive von Pirquet test is proof of tuberculosis of the spleen. I think, however, that with the clinical absence of tuberculosis or other disease in other organs and the presence of the positive tuberculin tests,

there was justified the assumption that we have a true case of primary tuberculosis of the spleen with polycythemia in this case. At least I would stand for that diagnosis until some other could be proved.

This case is of a good deal of interest scientifically for the reason that we have been able to watch a real case of polycythemia vera, probably proven to be of tuberculous origin, over six years of time, through three distinct exacerbations, and been able to watch the profound effect, on the blood and the size of the spleen, which radium produced with the use of benzol. My own clinical opinion is that we have received more benefit from the radium than the benzol. I have now under observation a man forty years of age, with polycythemia and enlarged spleen, who about two months ago vomited a bowlful of blood. This patient gives a four plus Wassermann and the diagnosis of syphilis of the spleen seems justified. In these two cases we have, therefore, polycythemia with splenomegaly caused by two of the great contenders for pathological honors, the tubercle bacillus and the spirochete of syphilis.

5. DR. J. G. CROSS reported the following case: This case is reported because of the great difficulty in making a diagnosis. The patient was a man of 64, weighing in health 190 pounds, a lawyer by profession. With the exception of a so-called "nervous breakdown" many years ago and a suspicion of tuberculosis as a young man, his history to July, 1923, is practically that of a healthy man. At that time he showed retention of urine and a prostatic enlargement was made out and operation advised by his physicians, Dr. Staples and Dr. Butler. Prostatectomy was done at Rochester in two stages and he returned home to Minneapolis in early November, 1923. Except for the presence of some albumin and pus in the urine as is common in such cases, his recovery seemed to be very good, and he resumed the practice of his profession.

The first week in January he attended the annual stag dinner given by one of his friends, at which such delicacies as pork sausages, sauerkraut, and buckwheat cakes were partaken of. He had some immediate distress—nausea and vomiting. He was seen about three days later because the vomiting did not cease. His temperature was 99.2 and as a matter of fact, never was raised to 100. Pulse rate 80 to 90, respiration normal. He complained of the nausea, and slight pain in the left loin extending around toward the back, at times beyond the posterior axillary line. There were no masses in the abdomen and a marked absence of any tender points. Bowel movements were easily induced with enema, and the urine contained, as above stated, pus and albumin, but no sugar and no casts. The stools were entirely negative, and especially I wish to emphasize the fact that at no time was fat or fatty acids present in the stool, nor was glycosuria ever found, though the urine was tested almost daily during the entire illness.

Blood examination showed 5,400,000 red cells, hemoglobin 80 to 85, white cells 23,000 to 24,160, with 88 per cent p. m. n., 12 per cent lymphocytes (5 small and 7 large), blood chemistry January 21st showed urea nitrogen 28.50, creatinin 1.88.

On account of persistent nausea no examination of the stomach with barium could be done. Fluoroscopy of the

chest, afterwards corroborated by roentgenography, gave very dense mediastinal shadows almost obliterating the left border of the heart, and extending above and to the outside of the aortic arch, as well as to the right of the heart strip on the other side. These shadows did not pulsate, and on account of their density were assumed to be probably due to new growths. At no time were there any symptoms referable to the chest except a temporary pleuritic pain on the left side, for which nothing could be found at autopsy.

On account of the absence of fever, the persistence of nausea and vomiting, the leukocytosis together with the x-ray picture in the chest, it seemed most likely even in the absence of a mass in the abdomen that the patient was suffering from new growth in the stomach and mediastinum. Death occurred on February 7th from asthenia.

Omitting the details unessential to the diagnosis, the autopsy findings were as follows:

The abdomen contains only a very small amount of clear fluid. The appendix is long, thin and adherent behind the cecum. It has the consistency of a fibrous cord. There are old fibrous bands between the gallbladder and the hepatic flexure of the colon, and the colon and duodenum. The omentum is adherent to the left costal margin.

The heart showed some degenerative changes but no gross valvular lesions. Coronaries not narrow. The lungs are light. No palpable nodules.

The liver weighed 2,140 grams. The cut surface showing very definite yellowish tinge. The gallbladder is dilated but not thickened, and there are no calculi in the cavity. The ducts are patent.

The stomach. There are no lesions of the mucous membranes. A semi-fluctuant mass protrudes into the fundus a short distance outside the stomach. No lesions are found anywhere in the gastrointestinal tract.

On cutting through the foramen of Winslow, cloudy fluid, similar to that previously mentioned, appears, but not in marked quantity. On separating the colon a cavity is entered which is at first thought to be the cavity of the stomach but it proves to be the markedly thickened lesser peritoneal cavity filled with cloudy fluid. In the posterior wall of this cavity is seen a yellowish necrotic mass about 2 cm. in diameter. Later investigation shows that this is necrotic pancreatic tissue. To the right of this necrotic mass is a small rounded cavity which on probing is found to lead to the foramen of Winslow. This channel is about 1 cm. in diameter. On following up the pancreatic duct from the ampulla it is found to lead to a necrotic mass about 3 cm. in diameter, involving the tail of the pancreas, and with necrosis extending into the lesser peritoneal cavity. In the adipose tissue about the pancreas, small yellowish nodules are found which grossly strongly suggest fat necroses. The semi-fluctuant mass near the cardiac end of the stomach is found to be an extra-gastric collection of fluid with fat necrosis in its wall.

The genital tract showed no gross changes except the operation scars and a rim of prostatic tissue, the mass of it representing about one-third that of an average prostate. In this is a cavity about 1 cm. in diameter and irregular in outline.

The lymph nodes at the bifurcation of the trachea are

moderately enlarged and show much coal pigment but in a few of them grayish white translucent areas are present, the largest of these measuring about 1 cm. in diameter and somewhat suggestive of tumor, although they may be hyperplastic lymphoid tissue. No lesions in the pre-aortic or pelvic lymph nodes. Marked enlargement of lymph nodes at the bifurcation of the trachea.

Microscopic examination showed marked tubular injury and arteriosclerotic change in the kidney. Prostate: no evidence of malignancy. Tracheobronchial lymph node: marked hyperplasia with necrosis but no evidence of carcinoma. Pancreas: extensive acute and chronic changes, the acute changes being ante-mortem necrosis with extensive leucocytic infiltration about these necroses, the chronic change being marked inter- and intralobular fibrosis.

DIAGNOSES

1. Suppurative pancreatitis.
2. Cloudy swelling of myocardium with epicardial petechial hemorrhages.
3. Fatty liver.

It will be seen that there are interesting features to this case from both the diagnostic and pathologic viewpoints. I believe it is safe to say that his condition was impossible to diagnose clinically. There was nothing in the physical examination, his symptoms, nor the laboratory findings which would lead one to look for a lesion in the pancreas. His presenting trouble was the constant nausea and persistent vomiting with increase of his white blood cells and absence of fever. It was evident at autopsy that there was enough functioning pancreas left to explain why there was no free fat in his stools, nor sugar in his urine.

A little later another patient was seen with a very much distended abdomen, absence of fever, and pain which prevented his lying down. This had been present only a few days. Previous health had been unusually good. The man, about 60 years old, was in active business life. The pain was epigastric. There was some vomiting but not persistent. There was almost no rise of temperature, but a white blood count between 18,000 and 20,000. In the region of the gallbladder there was a palpable mass somewhat tender to touch. In the epigastrium a tumor could be palpated, but its form and size were difficult to make out.

The abdomen was very tense like that found in serositis of the liver ascites. However, the dullness to percussion was entirely left-sided. The urine was sugar free. X-ray of the stomach showed a peculiar shape—a sort of teapot dome effect—in that the prepyloric antrum was narrowed to the size of a thumb for a distance from three to four inches. Gastric analysis was negative, free fat being found in the stools. Consultation with the surgeon was urged on the ground that surgical exploration of the pancreas should not be longer delayed. I will ask Dr. Mann to speak of this case from the surgical side, as he operated upon him.

DISCUSSION

DR. MANN: On examination this man presented two masses which could be felt. One, a low bulging mass in the epigastrium, and the other a sort of roughened mass in the gallbladder region but a little outside of that region. His symptoms were centered about the center of the ab-

domen; the pain was constant and rather intense. Having seen a few cases of pancreatic cyst and knowing that is about the only thing which presents a tumor which can be seen or felt in the epigastrium, I made a diagnosis of pancreatic cyst (provisional). At operation a mass presented exactly where the pancreas would be, about half the size of a croquet ball, rounded on one side, and at one point did have a cyst about the size of a large marble, so my diagnosis checked up with that in a small way. I made a small opening into this mass and we got some lobulated material from 1 cm. to 2 cm. long about the consistency of oysters, but did not get very much of it. On microscopic examination that proved to be lymphosarcoma. The mass on the left side of the liver was rolled up omentum.

This man stood the operation very well. He died today, over four weeks after his operation. He has had no pain since the operation. I presume it was the tension on that capsule which caused the pain.

The x-rays were as Dr. Cross has stated, and the diagnosis of the roentgenologist was carcinoma of the stomach, which we rather doubted. I presume a sarcoma of the retroperitoneal lymph glands beginning probably in some gland close in near the head of the pancreas.

DR. HEAD: I would like to ask Dr. Cross two questions. First, in the first case reported, did the man show evidence of profound prostration or exhaustion indicative of a serious organic condition, or did the clinical picture present more of a toxic state? Second, how long from the onset of the symptoms was it before the patient died?

DR. CROSS (in closing): It is hard to tell just when this

process started. I imagine that the stag dinner furnished the stimulus, after which things eventuated rather rapidly, but that he had the beginnings of this process in the pancreas for some time before. Of course that is speculation. The stag dinner took place on the 5th of January; I saw him on the 9th, and he died on February 7th. He was not markedly prostrated.

I want to mention the fact again that leucocytosis without fever was present in both of these cases. In the one case the pancreas was five or six times as large as a normal pancreas. There was almost no free fluid in the abdomen, and the distension of the abdomen was due to the increased size of the pancreas. I should be very suspicious again with a leucocytosis of 24,000 and absence of fever.

He was not prostrated, but he was nauseated almost continuously. There was no mass to be felt anywhere. He had pleuritic pain for a few days.

Another case of pancreatitis had exactly the same pain, but higher up. It might have been described in the same terms that one would describe splenic infarct.

He presented no symptoms of obstruction of the bowel; never had any difficulty with bowel movements.

6. DR. A. SCHWYZER showed several x-ray films of a case of empyema following pneumonia in a boy 11 years of age. Trocar and cannula were inserted and the cavity Dakinized.

The meeting adjourned.

JOHN E. HYNES,
Secretary.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

THE ANTIDIABETIC FUNCTIONS OF THE PANCREAS AND THE SUCCESSFUL ISOLATION OF THE ANTIDIABETIC HORMONE—INSULIN. J. J. R. MacLeod, Prof. of Physiology, University of Toronto, and F. G. Banting, Research Professor, University of Toronto. Series No. 2. 69 pages. Illus. St. Louis: C. V. Mosby Co., 1923. Cloth, \$1.50.

METHODS IN MODERN MEDICINE. The Manual of the Medical Service of George Dock, M.D., Sc.D. George R. Herrmann, M.D., Ph.D., Instructor in Medicine, University of Michigan. 521 pages. Illus. St. Louis: C. V. Mosby Co., 1924.

SOCIAL CONTROL OF THE FEEBLEMINDED. A Study of Social Programs and Attitudes in Relation to the Problems of Mental Deficiency. Stanley P. Davies, Ph.D., Exec. Secy. Committee on Mental Hygiene, New York State Charities Aid Association. 207 pages. New York: The National Committee for Mental Hygiene, Inc., 370 Seventh Avenue, 1923. Paper, \$1.25.

"OBSTETRICS FOR NURSES." Charles B. Reed, M.D., St. Louis, C. V. Mosby Co. Second Edition, 1923. Price, \$3.50.

So many of the present-day books intended for the in-

struction of the nurse-in-training and for the guidance of the post-graduate obstetric nurse, seem to the reviewer to have as their greatest aim the teaching of the scientific and theoretical phase (thus almost obscuring the more important practical side of the subject), that it is a great pleasure to him to read one that departs from the usual.

Such a book is Reed's "Obstetrics for Nurses" which is now in its second edition. In its 390 pages of text, this little book covers in a very satisfactory way all that the nurse who wishes to make obstetric-nursing her specialty, needs to master of the anatomy and physiology of the female generative organs, including pre-natal, lying-in, and post-partum care. The dietion is throughout clear and concise and the one hundred and forty-four illustrations are for the most part well chosen. There are twenty-five chapters in all, the last seven taking up Care of the Child, Cleanliness and Sterilization, Diets, and a Therapeutic Index with an appended glossary of more or less special terms and phrases.

In the first thirty-six pages there is given an easily understandable discussion of the anatomy and physiology of the pelvic organs with special emphasis on their relation to normal pregnancy. Next, there are four chapters on abnormal, as well as normal, pregnancy, including the Hygiene of Normal Pregnancy, a chapter that could well be read with benefit by every practitioner, reflecting as it does the present-day sound, common-sense ideas on this

subject. Following in orderly arrangement are three chapters dealing with normal labor, its course, mechanism and the nurse's duties throughout its conduct, both in the home and in the hospital. The normal puerperium is next considered in detail, and thereafter are seven chapters on the abnormalities and complications of labor and the puerperium, including one on Infections and one on Minor Operations (special technique for the nurse).

All in all, Dr. Reed's "Obstetrics for Nurses" is a distinct improvement over the usual style of books intended for a like purpose and which are so frequently mere abridged editions of the larger text-books on obstetrics. It is above all practical and the nurse who studies with it as her guide will, I am sure, be more than ever a valuable and efficient assistant to the obstetrician.

ROGER S. COUNTRYMAN, M.D.

MENTAL DISORDERS. An Introduction to the Study of Mental Disorders. By Francis M. Barnes, Jr., M.A., M.D., Associate Professor of Nervous and Mental Diseases in the St. Louis University Medical School, Neurologist to St. Mary's Hospital, Consultant Neurologist to St. John's Hospital, Consultant Psychiatrist to the St. Louis City Sanitarium, Consultant Neuropsychiatrist to the U. S. Veterans' Bureau, Ninth District, St. Louis. Second Edition. C. V. Mosby Company, St. Louis, 1923.

The purpose is to give in brief outline the important features of some of the more common types of mental diseases; the groups considered are ones presented before fourth year students' clinics. The second edition was prepared, the author states, in response to the request from teachers that the notes be made available to other students than those in Dr. Barnes' classes.

More than half the book consists of a historical introduction that is very interesting and instructive and of a discussion of various psychological features concerned in mental processes.

Part II discusses briefly various common types of psychoses, together with a discussion of psychoneuroses and defective states.

The author states that it has not been his purpose to write a complete treatise on psychiatry but to place in students' hands a brief outline of fundamentals of psychiatry.

It is written in an interesting manner and each chapter is complete in itself so that it may be used readily. It will be found of interest to those whose work is limited to psychiatry and of help not only to the undergraduate student but to the practitioner who wishes something covering the field of psychiatry that is not too exhaustive.

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Minnesota State Medical Association

DISTRICT AND COUNTY ROSTER

FIRST DISTRICT

COUNCILOR, W. L. BURNAP, M. D. (1 year)Fergus Falls

Clay-Becker County Medical Society

Annual meeting, December

President	Darrow, D. C.	Moorhead	Lowe, L. M.	Glyndon
Haight, G. G.	Gosslee, G. L.	Moorhead	Meighen, J. W.	Ulen
Secretary	Griffin, P. J.	Detroit	Pardee, K.	Moorhead
Heimark, J. H.	Gunderson, R. M.	Lake Park	Patterson, C. H.	Barnesville
Aborn, W. H.	Hagen, O. J.	Moorhead	Rutledge, L. H.	Detroit
Archibald, F. M.	Haight, G. G.	Audubon	Simison, C. W.	Hawley
Bergheim, M. C.	Heimark, Jacob H.	Moorhead	Thornby, H. J.	Moorhead
Bottolfson, B. T.	Hoit, E. E.	Detroit	Thysell, F. A.	Moorhead
Cyr, A.	Humphrey, E. W.	Moorhead	Weeks, L. C.	Detroit
	Larson, O. O.	Detroit	Winberg, O. K.	Lake Park

Red River Valley Medical Society

Kittson, Marshall, Polk, Roseau, Pennington, Red Lake and Norman Counties
Regular meetings in March, June, September and December

Annual meeting, December

President	Dryden, F. M.	Crookston	Nelson, H. E.	Crookston
Hollands, Wm. H.	Dunlop, Alex.	Crookston	Norman, J. F.	Crookston
Secretary	Froelich, H. W.	Thief River Falls	Ohnstad, J.	McIntosh
Oppegaard, M. O.	Henney, Wm. H.	McIntosh	Oppegaard, M. O.	Crookston
Adkins, C. M.	Hodgson, H. H.	Crookston	Roy, J. A.	Red Lake Falls
Bertelson, O. L.	Hollands, Wm. H.	Fisher	Shaleen, A. W.	Hallock
Bratrud, O. E.	Holte, Halvor	Crookston	Shedlov, A.	Gully
Bratrud, Theo.	Kahala, Arthur	Crookston	Shelland, J. T.	Ada
Daniels, W. H.	Larson, A. L.	Fertile	Watson, N. M.	Red Lake Falls
Delmore, J. L.	Locken, O. E.	Crookston	Wattam, G. S.	Warren
	Morley, G. A.	Crookston	Wiltrout, I. Geo.	Oslo

West Central Minnesota Medical Society

Bigstone, Traverse, Stevens and Pope Counties

Regular meetings, June and December

Annual meeting, December

President	Bolsta, Chas.	Ortonville	Leuty, Amos	Morris
Fitzgerald, E. T.	Caine, C. E.	Morris	Linde, Herman	Cyrus
Secretary	Crandall, Wm.	Graceville	Oliver, C. I.	Graceville
Leuty, Amos	Eberlin, E. A.	Glenwood	O'Donnell, D. M.	Ortonville
Arnsen, J. M.	Elsey, J. R.	Glenwood	Opheim, O. V.	Starbuck
Bates, B. V.	Ewing, C. F.	Wheaton	Pierson, Claude M.	Wheaton
Bergen, Otto	Fitzgerald, E. T.	Morris	Randall, B. M.	Graceville
	Gibbon, L. L.	Lowry	Ransom, L. M.	Hancock
	Karn, B. R.	Ortonville	Shelver, H. J.	Ortonville
	Leland, J. T.	Herman	Weir, J. D.	Beardsley

Park Region District Medical Society

Ottertail, Douglas, Grant and Wilkin Counties

Regular meetings, second Wednesday in January, April, July and October

Annual meeting in October

President	Estrem, C. O.	Fergus Falls	Naegeli, Frank	Fergus Falls
Wray, W. E.	Freeborn, J. A.	Fergus Falls	Nelson, O. N.	Battle Lake
Secretary	Goodson, Catherine M.	Retreat, Pa.	Otto, H. C.	Frazee
Paulson, Theo. S.	Hand, W. R.	Elbow Lake	Parson, L. R.	Elbow Lake
Baker, A. C.	Haskell, A. D.	Alexandria	Patterson, W. L.	Fergus Falls
Boysen, P.	Haugan, O. M.	Fergus Falls	Paulson, Theo.	Fergus Falls
Brabec, F. J.	Haugen, G. T.	Fergus Falls	Powers, F. W.	Barrett
Broker, W. S.	Kittelton, Theo. N.	Fergus Falls	Reeve, E. T.	Elbow Lake
Burnap, W. L.	Lee, W. A.	Fergus Falls	Satersmoen, Theo.	Pelican Rapids
Cowing, P. G.	Lewis, A. J.	Henning	Schneider, Clarence L.	Deer Creek
Drought, W. W.	Liebold, H. H.	Parkers Prairie	Sherping, O. Th.	Fergus Falls
Esser, John	Love, Fred A.	Carlos	Vail, J. B.	New York Mills
	McCann, G. E.	Onamia	Vigen, J. G.	Fergus Falls
	Meckstroth, C. N.	Brandon	Wray, W. E.	Campbell

SECOND DISTRICT

COUNCILOR, J. G. MILLSPAUGH, M. D. (2 years) Little Falls

Aitkin County Medical Society

Regular meetings, first Monday in each month
Annual meeting, first Monday in DecemberPresident
Graves, Carlton Aitkin
Secretary
Ratcliffe, J. J. AitkinCatlin, T. J. Palisade
Graves, C. Aitkin
Kelly, B. W. AitkinKerlan, S. Z. McGregor
McHugh, R. F. Aitkin
Ratcliffe, J. J. Aitkin

Upper Mississippi Medical Society

Crow Wing, Morrison, Cass, Todd, Wadena, Clearwater, Koochiching, Hubbard
and Beltrami CountiesRegular meetings in May and January
Annual meeting, JanuaryPresident
Johnson, E. W. Bemidji
Secretary
Badeaux, G. I. BrainerdAgnew, A. T. Bertha
Allen, F. A. Crosby
Allen, F. H. Staples
Badeaux, G. I. Brainerd
Beise, R. A. Brainerd
Bone, Merle Kelliher
Button, A. J. Hackensack
Cantwell, W. F. Internat'l Falls
Campbell, D. R. Bagley
Christie, G. R. Long Prairie
Christie, R. L. Long Prairie
Corrigan, J. E. Spooner
Courtney, Walter Brainerd
Craig, C. C. International Falls
Crowl, Verne C. Bertha
Davis, L. T. Wadena
Davis, T. C. Wadena
Derauf, B. I. Brainerd
Douglas, H. E. BlackduckDouglass, J. E. State Sanatorium
Forrest, C. G. Clearbrook
Garlock, A. V. Bemidji
Garlock, D. H. Bemidji
Gerber, Milo P. Brainerd
Geyman, M. J. Browerville
Ghostley, Mary C. Internat'l Falls
Goodheart, C. J. Akeley
Gilmore, R. Bemidji
Halenbeck, P. L. Crosby
Hall, P. M. State Sanatorium
Halper, Philip St. Paul
Healy, R. J. Pierz
Holman, E. E. Pine River
Holst, C. F. Little Falls
Holst, J. B. Little Falls
House, Z. E. Cass Lake
Houston, C. A. Park Rapids
Hooslef, J. International Falls
Johnson, E. W. Bemidji
Johnson, O. V. Sebeka
Kenyon, Paul Wadena
Laney, R. L. Puposky
McCann, D. F. Bemidji
McCum, E. H. Bemidji
Miller, W. A. New York MillsMillspaugh, J. G. Little Falls
Morell, W. N. Verndale
Nelson, Nesmuth Brainerd
Nicholson, Jos. Brainerd
Nordin, C. G. Brainerd
Parrott, C. W. Long Prairie
Pengelly, E. J. Ironton
Pierce, Chas. H. Wadena
Prendergast, H. J. Brainerd
Roberts, L. M. Little Falls
Shannon, S. S. Crosby
Smith, B. A. Crosby
Smith, E. H. Bemidji
Smith, W. H. Cass Lake
Stewart, O. E. Bemidji
Thabes, J. A. Brainerd
Van Valkenburg, B. F. Long PrairieWaldie, Geo. McL. Wabasha
Watson, A. M. Royalton
Watson, J. D. Holdingford
Wilcox, F. L. Walker
Will, W. W. Bertha
Williams, R. J. Pine River
Withrow, M. E. Internat'l Falls
Woolway, C. J. Deerwood

THIRD DISTRICT

COUNCILOR, H. LONGSTEET TAYLOR, M. D. (2 years) St. Paul

Ramsey County Medical Society

Regular meetings, last Monday of each month except June, July and August
Annual meeting last Monday in JanuaryPresident
Larsen, C. L. St. Paul
Secretary
Chatterton, C. C. St. PaulAbbott, J. S. St. Paul
Abramovich, J. H. St. Paul
Ahrens, A. E. St. Paul
Ahrens, A. H. St. Paul
Alden, J. F. St. Paul
Aldes, Harry St. Paul
Alexander, F. H. St. Paul
Allen, Mason St. Paul
Anderson, W. T. St. Paul
Arends, A. T. St. Paul
Armstrong, J. M. St. Paul
Arnquist, A. S. St. Paul
Arouni, Khalil St. Paul
Arzt, C. P. St. Paul
Bacon, Donald K. St. Paul
Bacon, Knox St. Paul
Bacon, L. C. St. Paul
Balcome, F. E. St. Paul
Ball, C. R. St. Paul
Barry, L. W. St. Paul
Barsness, Nellie St. Paul
Beadie, W. D. Cannon Falls
Beals, Hugh St. Paul
Beckley, F. L. St. Paul
Bell, C. C. St. Paul
Benep, L. M. St. Paul
Bennion, P. H. St. Paul
Bentley, Norman P. St. PaulBerrisford, Paul D. St. Paul
Binger, H. E. St. Paul
Birnberg, T. L. St. Paul
Bock, R. A. St. Paul
Boeckmann, Eduard St. Paul
Boeckmann, Egil St. Paul
Bohland, E. H. St. Paul
Bole, R. S. St. Paul
Boleyn, E. S. Stillwater
Bolstad, H. C. St. Paul
Bosworth, Robinson St. Paul
Brand, G. D. St. Paul
Bray, E. R. St. Paul
Brimhall, J. B. St. Paul
Brodie, Walter D. St. Paul
Brooks, D. F. St. Paul
Brooks, G. F. St. Paul
Brown, Edw. I. St. Paul
Brown, John C. St. Paul
Brown, LeRoy St. Paul
Burch, F. E. St. Paul
Burfiend, G. H. St. Paul
Burns, F. W. St. Paul
Burns, R. M. St. Paul
Buscher, H. St. Paul
Caldwell, Kenneth S. St. Paul
Cameron, J. A. St. Paul
Campbell, J. E. South St. Paul
Cannon, Harry St. Paul
Carman, C. L. St. Paul
Carman, Paul I. St. Paul
Carroll, Wm. C. St. Paul
Cavanaugh, J. O. St. PaulChandler, O. B. St. Paul
Chatterton, C. C. St. Paul
Christiansen, A. St. Paul
Christison, J. T. St. Paul
Clark, T. C. Soldiers Home, Mpls.
Cobb, S. G. St. Paul
Colby, Woodard St. Paul
Cole, Wallace St. Paul
Collie, H. G. St. Paul
Colvin, A. R. St. Paul
Comstock, A. E. St. Paul
Conner, Wm. H. St. Paul
Connor, C. E. St. Paul
Cook, Paul B. St. Paul
Countryman, Roger S. St. Paul
Cowern, E. W. North St. Paul
Dack, L. G. St. Paul
Darling, J. B. St. Paul
Daugherty, E. B. St. Paul
Daugherty, L. E. St. Paul
Davis, Herbert St. Paul
Davis, William St. Paul
Dedolph, K. St. Paul
Dickson, Thos. H., Jr. St. Paul
Dittman, Geo. C. St. Paul
Dohm, A. J. St. Paul
Donohue, P. F. St. Paul
Drake, Carl B. St. Paul
Dunn, J. N. St. Paul
Earl, Geo. A. St. Paul
Earl, Robert O. St. Paul
Edlund, G. St. Paul
Ely, O. S. South St. Paul

Engberg, E. J.	St. Paul	Knauff, M. K.	St. Paul	Rothrock, J. L.	St. Paul
Ernest, G. C.	St. Paul	Kvitrud, G.	St. Paul	Rothschild, H. J.	St. Paul
Eshelby, E. C.	St. Paul	Langenderfer, F. V.	St. Paul	Roy, Philemon	St. Paul
Evert, John A.	St. Paul	Larsen, C. L.	St. Paul	Ruhberg, Geo. N.	St. Paul
Ferguson, J. C.	St. Paul	Larson, M. L.	St. Paul	Russell, H. R.	St. Paul
Fesler, Harold H.	St. Paul	Leahy, B.	St. Paul	Rutherford, W. C.	St. Paul
Flagstad, A. E.	St. Paul	Leavenworth, R. O.	St. Paul	Ryan, John J.	St. Paul
Fogarty, C. W.	St. Paul	Leitch, Archibald	St. Paul	Satterlund, V. L.	St. Paul
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Freeman, C. D.	St. Paul	Lerche, William	St. Paul	Schatz, F. J.	St. Paul
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Furber, W. W.	Cottage Grove	Lewis, W. W.	St. Paul	Schons, E.	St. Paul
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Geer, Everett K.	St. Paul	Lufkin, H. M.	St. Paul	Schwyzzer, Arnold	St. Paul
Geissinger, John D.	St. Paul	Lundholm, A. M.	St. Paul	Shellington, M. A.	St. Paul
Geist, Geo. A.	St. Paul	McCarthy, W. R.	St. Paul	Senkler, G. E.	St. Paul
Ghent, Harry	St. Paul	McClanahan, J. H.	White Bear	Shannon, W. Ray	St. Paul
Ghent, M. M.	St. Paul	McClanahan, T. S.	White Bear	Shapere, A. D.	St. Paul
Giere, E. O.	St. Paul	McCloud, C. N.	St. Paul	Shellman, John L.	St. Paul
Gilfillan, J. S.	St. Paul	McDavitt, Thomas	St. Paul	Shimonek, Anton	St. Paul
Ginsberg, Wm.	St. Paul	McKeon, Owen	St. Paul	Simon, B. F.	St. Paul
Goltz, E. V.	St. Paul	McLaren, Jennette M.	St. Paul	Simon, Geo. H.	St. Paul
Gotham, C. L.	St. Paul	McNevin, C. F.	St. Paul	Skinner, H. O.	St. Paul
Gratzek, Thos.	St. Paul	MacLaren, Archibald	St. Paul	Snyder, Geo. W.	St. Paul
Greene, C. L.	St. Paul	Maloney, T. J.	St. Paul	Sohlberg, Olof	St. Paul
Gruenhagen, Arnold P.	St. Paul	Martineau, J. L.	St. Paul	Sprafka, J. M.	St. Paul
Hagaman, Geo. K.	St. Paul	Meyerding, E. A.	St. Paul	Staley, J. C.	St. Paul
Hall, A. R.	St. Paul	Mintener, John W.	St. Paul	Steen, A. H.	Cottage Grove
Hammes, E. M.	St. Paul	Mitchell, Frederick	St. Paul	Sterner, E. G.	St. Paul
Hammond, J. F.	St. Paul	Mogilner, S. N.	St. Paul	Sterner, O. W.	St. Paul
Hauser, Victor	St. Paul	Molander, H. A.	St. Paul	Stevens, F. A.	Lake Elmo
Hawkins, V. J.	St. Paul	Morris, R. Edwin	St. Paul	Stewart, Alexander	St. Paul
Heath, A. C.	St. Paul	Morrissey, F. B.	St. Paul	Stierle, Adolph	St. Paul
Hengstler, W. H.	St. Paul	Morse, Russell W.	St. Paul	Stinnette, S. E.	St. Paul
Hensel, C. N.	St. Paul	Mortenson, N. G.	St. Paul	Stolpestad, H. L.	St. Paul
Heron, Roy C.	St. Paul	Moss, Myer N.	St. Paul	Swanson, Edwin O.	St. Paul
Herrmann, E. T.	St. Paul	Moynihan, T. J.	St. Paul	Sweeney, Arthur	St. Paul
Hesseltine, V. G.	Taylor's Falls	Murphy, E. F.	St. Paul	Swendson, J. J.	St. Paul
Hesselgrave, S. S.	St. Paul	Myers, Thos.	St. Paul	Taylor, H. L.	St. Paul
Hilger, A. W.	St. Paul	Nehrer, F. H.	St. Paul	Teisberg, C. B.	St. Paul
Hilger, D. D.	St. Paul	Nelson, L. A.	St. Paul	Thauwald, C. C.	St. Paul
Hilger, L. A.	St. Paul	Nichols, A. E.	St. Paul	Tiber, L. J.	St. Paul
Hoff, Alfred	St. Paul	Nippert, H. T.	St. Paul	Van Norman, K. H.	St. Paul
Hoff, Peder A.	St. Paul	Norris, E. H.	St. Paul	Van Slyke, Chas. A.	St. Paul
Hoffman, Max H.	St. Paul	Nye, Katherine A.	St. Paul	Von der Weyer, William	St. Paul
Holcomb, J. T.	St. Paul	Nye, Lillian	St. Paul	Waas, Chas.	St. Paul
Holcomb, O. W.	St. Paul	O'Brien, H. J.	St. Paul	Wald, K. H.	St. Paul
Holl, P. M.	Minneapolis	O'Connor, J. P.	St. Paul	Walker, R. E.	St. Paul
Howard, M. A.	St. Paul	O'Connor, J. V.	St. Paul	Wallinga, John H.	St. Paul
Howard, Wm. H.	Minneapolis	Ogden, Harry	St. Paul	Walters, B. Frank	St. Paul
Howard, Wm. S.	St. Paul	Ogden, Warner	St. Paul	Warner, E. F.	St. Paul
Hullsieck, H. E.	St. Paul	Ohage, Justus	St. Paul	Warren, E. L.	St. Paul
Hultkrans, Joel C.	St. Paul	Ohage, Justus, Jr.	St. Paul	Warneck, R. W.	St. Paul
Hunt, H. E.	St. Paul	Olson, Chas. A.	St. Paul	Warwick, Margaret	St. Paul
Ide, Arthur W.	St. Paul	Ostergren, E. W.	St. Paul	Welch, M. C.	St. Paul
Ingerson, C. A.	St. Paul	Pearson, F. R.	St. Paul	Wheeler, M. W.	St. Paul
Jesion, J. W.	St. Paul	Pedersen, A. H.	St. Paul	Whitacre, J. C.	St. Paul
Johnson, Asa M.	St. Paul	Perry, C. G.	St. Paul	Whitcomb, Ed. H.	St. Paul
Johnson, Hartland C.	St. Paul	Peterson, V. N.	St. Paul	White, J. S.	St. Paul
Johnson, T. H.	St. Paul	Pine, Auten A.	St. Paul	Whitmore, F. W.	St. Paul
Jones, E. M.	St. Paul	Plondke, F. J.	St. Paul	Whitney, A. W.	St. Paul
Kannary, E. L.	St. Paul	Platt, J. J.	St. Paul	Williams, Clayton	St. Paul
Kelly, John V.	St. Paul	Ramsey, W. R.	St. Paul	Winnick, J. B.	St. Paul
Kelly, Paul H.	St. Paul	Richards, E. T. F.	St. Paul	Wold, K. C.	St. Paul
Kesting, Herman	St. Paul	Richardson, H. E.	St. Paul	Wood, H. G.	St. Paul
King, Walter E.	St. Paul	Riggs, C. Eugene	St. Paul	Ylvisaker, L. S.	St. Paul
Kistler, A. S.	St. Paul	Ritchie, H. P.	St. Paul	Zander, C. H.	St. Paul
Klein, H. N.	St. Paul	Rogers, John T.	St. Paul	Zimmerman, H. B.	St. Paul

Washington County Medical Society

Regular meetings held on second Tuesday of the odd numbered months
Annual meeting, November

President	Freligh, E. O.	Stillwater	Mingo, F. E.	Hugo
Landeon, F. G.	Haines, J. H.	Stillwater	Newman, G. A.	Stillwater
Secretary	Humphrey, W. R.	Stillwater	Poirier, J. A.	Forest Lake
Josewski, R. J.	Johnson, Walfred	Stillwater	Sherman, C. H.	Bayport
Brown, A. E.	Josewski, R. J.	Stillwater	Stuhr, J. W.	Stillwater
	Kalino, D.	Stillwater	Thompson, V. C.	Marine-on-St. Croix
	Landeon, F. G.	Stillwater		

Chisago-Pine County Medical Society

Annual meeting, second Tuesday in May

President	Dredge, H. P.	Sandstone	Kelsey, C. G.	Hinckley
Dredge, H. P.	Ehmke, W. C.	Willow River	Paulson, C. W.	North Branch
Secretary	Flom, A. O.	Chisago City	Stowe, A. J.	Rush City
Kelsey, C. G.	Freymler, E. F.	Cloverton	Tilton, A. J.	Alden
Bohling, B. S.	Gray, Clyde E.	Rush City	Wiseman, Robert L.	Pine City
	Gunz, A. W.	Center City	Zeien, Thos.	North Branch

Central Minnesota District Medical Society

Mille Lacs, Sherburne, Isanti, Anoka and Kanabec Counties
Regular meetings, July and October
Annual meeting, July

President
Swenson, CharlesBraham
Secretary
Cooney, H. C.Princeton
Bossert, C. S.Mora
Caine, A. T.Anoka

Caley, G. R.Princeton
Cooney, H. C.Princeton
Gates, C. E.Anoka
Hall, E. L.Princeton
Norrsgard, H. T.Milaca
Peterson, A. A.Mora
Roadman, I. M.Ponsford

Roehlke, A. B.Elk River
Shulean, N. S.Cambridge
Spurzem, R. J.Anoka
Stocking, F. F.Milaca
Swennes, O. S.Wahkon
Swenson, CharlesBraham
Vrooman, F. E.St. Francis

St. Louis County Medical Society

St. Louis, Cook, Lake, Itasca and Carlton Counties
Regular meetings, second Thursday of each month
Annual meeting, second Thursday in October

President
Martin, T. R.Duluth
Secretary
Magney, F. H.Duluth

Abbott, Wm. P.Duluth
Adams, B. S.Hibbing
Anderson, Hilding C.Duluth
Arminen, K. V.Duluth
Armstrong, E. L.Duluth
Athens, A. S.Buhl
Ayers, G. T.Ely
Bagley, W. R.Duluth
Barney, L. A.Duluth
Barrett, FredGilbert
Berdez, G. L.Duluth
Bergquist, K. E.Duluth
Binet, H. E.Grand Rapids
Blacklock, S. S.Hibbing
Blakely, C. C.Barnum
Bouman, P. G.Duluth
Bowen, R. L.Hibbing
Boyer, S. H.Duluth
Braden, A. J.Duluth
Bradley, E. L.Duluth
Bray, C. W.Biwabik
Briggs, F. W.Duluth
Bullen, F. W.Hibbing
Burns, H. J.Duluth
Burns, R. L.Two Harbors
Carstens, C. F.Hibbing
Chapman, T. L.Duluth
Cheney, E. L.Duluth
Christenson, E. P.Two Harbors
Clark, F. F.Duluth
Collins, A. N.Duluth
Collins, H. C.Duluth
Cosgrove, J. H.Duluth
Coventry, W. A.Duluth
Crowe, J. H.Virginia
Daniels, H. A.Eveleth
Davis, B. F.Duluth
Davis, H. S.Duluth
Dixon, J. F.Carlton
Doolittle, L. E.Duluth
Doyle, Geo. C.Duluth
Drenning, F. C.Duluth
Durgin, F. L.Nopeming
Eckman, P. F.Duluth
Eisenman, W. F.Chisholm
Ekblad, J. W.Duluth
Eklund, W. J.Duluth
Elias, F. J.Duluth
Eppard, R. M.Cloquet
Estrem, T. A.Hibbing
Ewens, H. B.Virginia
Fahey, E. W.St. Paul
Ferreira, G. J.Aurora
Fleming, J.Cloquet
Forbes, R. S.Duluth
Fuerster, Frederick.Proctor
Gardner, R. D.Eveleth
Gauthier, W.Virginia

Gendron, J. F.Grand Rapids
Gilbert, J. D.Carlton
Gillespie, M. G.Duluth
Gillespie, N. H.Duluth
Giroux, A. A.Duluth
Goodman, C. E.Virginia
Graham, David.Duluth
Graham, Reginald.Duluth
Graham, Robert.Duluth
Grawn, F. A.Duluth
Greeley, L. Q.Duluth
Ground, H. T.Virginia
Grover, F. E.Duluth
Hall, A. E.Virginia
Hall, A. E.Kasson
Haney, C. L.Duluth
Harris, C. N.Nashwauk
Hastings, D. R.Duluth
Hatch, W. E.Duluth
Hayes, M. F.Nashwauk
Heimark, O. E.Duluth
Hicks, F. A.Grand Marais
Hill, F. E.Duluth
Hirschboeck, F. J.Duluth
Hirschfield, M. S.Duluth
Hovde, H.Duluth
Hursch, M. M.Grand Rapids
Jensen, T. J.Duluth
Kean, N. D.Coleraine
Keyes, C. R.Duluth
Kiesling, I. H.Nashwauk
Kling, Wm. S.Eveleth
Klein, C. E.Duluth
Knapp, F. N.Duluth
Kohlbray, C. O.Duluth
Kraft, P.Duluth
Kuth, J. R.Duluth
Laird, A. T.Nopeming
Lampson, H. G.Duluth
Lenont, C. B.Virginia
Lepak, F. J.Duluth
Lindgren, E. I.Duluth
Litman, Samuel, N.Meadowlands
Loofbourrow, E. H.Keewatin
Ium, C. E.Duluth
Lynam, F.Duluth
McCarthy, Paul D.Babitt
McComb, C. F.Duluth
McCoy, Mary.Duluth
McCuen, J. A.Duluth
McDonald, A. L.Duluth
McGiffert, E. N.Duluth
McHaffie, O. L.Duluth
McIntyre, E. H.Virginia
McMurtrie, W. D.Marble
McNutt, John R.Two Harbors
Magie, W. H.Duluth
Magney, F. H.Duluth
Manley, J. R.Duluth
Martin, T. R.Duluth
Mattill, P. M.Oak Terrace
Merriman, L. L.Duluth
Miller, Walter H.Buhl
Miners, G. A.Deer River
Monroe, P. B.Soudan

More, C. W.Eveleth
Morsman, L. W.Hibbing
Morss, C. R.Zumbrota
Murray, D. D.Duluth
Nelson, E. H.Chisholm
Nicholson, M. A.Duluth
Olson, Albert E.Duluth
Olson, O. S.Duluth
Oredson, O. A.Duluth
Pake, S. G.Duluth
Paradine, J.Duluth
Pare, L. T.Duluth
Parker, O. W.Ely
Paulson, G. A.Duluth
Payette, C. H.Duluth
Pennie, D. F.Duluth
Perley, A. E.Chisholm
Powers, J. E.Duluth
Raadquist, C. S.Hibbing
Radtke, H. P.Chisholm
Raihala, J.Virginia
Raiter, Franklin W. S.Cloquet
Raiter, Roy F.Cloquet
Reynolds, H.Hibbing
Rippert, J. A.Duluth
Robinson, J. M.Duluth
Rood, D. C.Duluth
Rowe, O. W.Duluth
Rudie, P. S.Duluth
Ryan, J. W.Duluth
St. Clair, G. G.Duluth
Scherer, C. A.Duluth
Schroeder, C. H.Duluth
Schwartz, A. N.Duluth
Seashore, D. E.Duluth
Shapiro, E. Z.Duluth
Shaw, A. W.Buhl
Slyfield, F. F.Duluth
Smith, C. M.Duluth
Spicer, F. W.Duluth
Spurbeck, R. G.Cloquet
Strathern, M. L.Gilbert
Strobel, W. G.Duluth
Stuart, A. B.Cloquet
Sukeforth, L. A.Duluth
Sutherland, H. N.Ely
Taylor, A. C.Duluth
Taylor, C. W.Duluth
Tibbetts, M. H.Duluth
Tilderquist, D. L.Duluth
Tuohy, E. L.Duluth
Turnbull, F. M.Duluth
Urberg, S. E.Duluth
Van de Steeg, Wm. G.Biwabik
Vercellini, C. E.Duluth
Walker, A. E.Duluth
Walters, F. R.Moose Lake
Webber, E. E.Proctor
Webster, H. E.Duluth
Weirick, H. E.Duluth
Wilkinson, Stella.Duluth
Winter, J. A.Duluth
Young, T. O.Duluth
Young, V. A.Duluth

FOURTH DISTRICT

COUNCILOR, W. H. CONDIT (1 year)Minneapolis

Hennepin County Medical Society

Regular meetings, first Monday in each month excepting July and August
Annual meeting, first Monday in January

President
Wright, C. B.Minneapolis
Secretary
La Vake, R. T.Minneapolis

Abbott, A. W.Minneapolis
Adair, F. L.Minneapolis
Ailing, C. P.Minneapolis
Allen, H. W.Minneapolis

Allison, R. G.Minneapolis
Anderson, A. E.Minneapolis
Anderson, Arnt.Minneapolis
Anderson, D. D.Minneapolis

Anderson, E. D.....	Minneapolis	Everlof, J. L.....	Minneapolis	Kusske, A. L.....	Minneapolis
Anderson, James K.....	Deerwood	Fansler, W. A.....	Minneapolis	Lajoie, J. M.....	Minneapolis
Annis, H. B.....	Minneapolis	Farr, R. E.....	Minneapolis	Lane, Laura A.....	Minneapolis
Arey, H. C.....	Excelsior	Feidt, W. W.....	Minneapolis	Lapierre, C. A.....	Minneapolis
Arvidson, C. G.....	Minneapolis	Fischer, G.....	Minneapolis	Laurent, A. A.....	Minneapolis
Aune, Martin.....	Minneapolis	Fjeldstad, C. Alford.....	Minneapolis	LaVake, R. T.....	Minneapolis
Aurand, W. H.....	Minneapolis	Fjellman, R. C.....	Minneapolis	Leavitt, H. H.....	Minneapolis
Aurness, P. A.....	Minneapolis	Fleming, A. S.....	Minneapolis	Lebowski, Jos. A.....	Minneapolis
Avery, J. F.....	Minneapolis	Fleming, C. Filmore.....	Minneapolis	Lee, H. M.....	Minneapolis
Aylmer, A. L.....	Minneapolis	Flocken, Chas. F.....	Minneapolis	Lee, John W.....	Minneapolis
Baier, Florence.....	Minneapolis	Fox, John M.....	Minneapolis	Leland, M. N.....	Minneapolis
Baker, A. T.....	Minneapolis	Franzen, H. C.....	Minneapolis	Lemstrom, Jarl.....	Minneapolis
Baker, E. L.....	Minneapolis	Gammell, J. H.....	Minneapolis	Lewis, J. D.....	Minneapolis
Baker, Looe.....	Minneapolis	Gardner, E. L.....	Minneapolis	Lind, C. J.....	Minneapolis
Bakke, O. H.....	Minneapolis	Geist, Emil.....	Minneapolis	Lippman, H. S.....	Minneapolis
Baldwin, L. B.....	Minneapolis	Gessler, Paul W.....	Minneapolis	List, Walter E.....	Minneapolis
Bank, Harry E.....	Minneapolis	Gilles, F. L.....	Minneapolis	Litchfield, John.....	Minneapolis
Barber, J. P.....	Minneapolis	Gordon, G. J.....	Minneapolis	Litzenberg, J. C.....	Minneapolis
Barden, Norman.....	Minneapolis	Gosin, D. F.....	Minneapolis	Logefell, Rudolph.....	Minneapolis
Barron, Moses.....	Minneapolis	Goss, Harold L.....	Minneapolis	Long, Jesse.....	Minneapolis
Bass, G. W.....	Minneapolis	Grave, Floyd.....	Minneapolis	Loomis, E. A.....	Minneapolis
Baxter, S. H.....	Minneapolis	Green, E. K.....	Minneapolis	Lundgren, A. C.....	Minneapolis
Beard, Archie.....	Minneapolis	Groll, S.....	Minneapolis	Lynch, M. J.....	Minneapolis
Beaudoux, H. A.....	Minneapolis	Gunderson, Harley J.....	Minneapolis	Lynch, John.....	Minneapolis
Bedford, E. W.....	Minneapolis	Gunderson, Nels. A.....	Minneapolis	Lysne, Henry.....	Minneapolis
Bell, J. W., Jr.....	Minneapolis	Habein, Harold C.....	Minneapolis	McCarthy, Donald.....	Minneapolis
Bell, J. W., Sr.....	Minneapolis	Hacking, Frank.....	Minneapolis	McCartney, Jas. S.....	Minneapolis
Benedict, E. E.....	Minneapolis	Hagen, G. L.....	Minneapolis	McDaniel, Oriana.....	Minneapolis
Benjamin, A. E.....	Minneapolis	Haggard, G. D.....	Minneapolis	McDermott, T. E.....	Minneapolis
Benn, F. G.....	Minneapolis	Hall, J. M.....	Minneapolis	McEachran, A.....	Minneapolis
Benson, R. D.....	Minneapolis	Hallowell, W. H.....	Minneapolis	McFarland, Arthur H.....	Minneapolis
Bessenes, A. N.....	Minneapolis	Hamel, Arnold L.....	Minneapolis	McIntyre, George.....	Minneapolis
Bessenes, Al. N., Jr.....	Minneapolis	Hamel, C. E.....	Minneapolis	McKinley, C. A.....	Minneapolis
Bessenes, Daniel H.....	Minneapolis	Hamilton, A. S.....	Minneapolis	McKinley, F. C.....	Minneapolis
Bessenes, Wm. A.....	Minneapolis	Hamlin, Geo. B.....	Minneapolis	McKinney, F. S.....	Minneapolis
Bishop, Chas. W.....	Minneapolis	Hannah, H. B.....	Minneapolis	McLaughlin, Jas. A.....	Minneapolis
Bissell, F. S.....	Minneapolis	Hansen, Erling.....	Minneapolis	McPheeters, H. O.....	Minneapolis
Blake, James.....	Hopkins	Hansen, Olga.....	Minneapolis	MacDonald, A. E.....	Minneapolis
Bockman, M. W. H.....	Minneapolis	Hare, E. R.....	Minneapolis	MacDonald, D. A.....	Minneapolis
Booth, A. E.....	Minneapolis	Harrington, C. D.....	Minneapolis	MacDonald, I. C.....	Minneapolis
Boquist, E. T. W.....	Minneapolis	Harrington, F. E.....	Minneapolis	Macnie, John.....	Minneapolis
Boreen, C. A.....	Minneapolis	Hartzell, Thos. B.....	Minneapolis	Maland, C. O.....	Minneapolis
Bouman, H. A. H.....	Minneapolis	Haverfield, Addie R.....	Minneapolis	Mann, A. T.....	Minneapolis
Bracken, H. M.....	New York City	Hayes, J. M.....	Minneapolis	Marley, W. J.....	Minneapolis
Bratrud, Arthur F.....	Minneapolis	Head, G. D.....	Minneapolis	Mariette, E.....	Hopkins
Brooks, Chas. N.....	Minneapolis	Hearn, Wm. O.....	Minneapolis	Mark, D. B.....	Minneapolis
Brown, E. J.....	Minneapolis	Hedback, A. E.....	Minneapolis	Matchan, Glen R.....	Minneapolis
Brown, E. D.....	Minneapolis	Heim, R. R.....	Minneapolis	Matthews, Justus.....	Minneapolis
Brown, R. S.....	Minneapolis	Helk, H. H.....	Minneapolis	Maxeiner, Stanley R.....	Minneapolis
Brunkow, C. W.....	Minneapolis	Hendrickson, J. F.....	Minneapolis	May, W. H.....	Minneapolis
Bulkley, Kenneth.....	Minneapolis	Henry, C. E.....	Minneapolis	Mead, Marion A.....	Minneapolis
Butler, John.....	Minneapolis	Henry, Myron O.....	Minneapolis	Merkert, G. L.....	Minneapolis
Byrnes, W. J.....	Minneapolis	Hiebert, J. P.....	Minneapolis	Meyer, E. L.....	Minneapolis
Cabot, V. S.....	Minneapolis	Higgins, J. H.....	Minneapolis	Michael, J. C.....	Minneapolis
Calkins, L. A.....	Minneapolis	Hill, Eleanor J.....	Minneapolis	Michelson, H. E.....	Minneapolis
Cameron, Angus L.....	Minneapolis	Hirschfield, Adolph.....	Minneapolis	Moir, Wm. W.....	Minneapolis
Camp, Walter E.....	Minneapolis	Hoaglund, Arthur W.....	Minneapolis	Monahan, J. A.....	Minneapolis
Campbell, Lowell M.....	Minneapolis	Hobbs, C. A.....	Minneapolis	Moorhead, M. B.....	Minneapolis
Campbell, Robert.....	Minneapolis	Hodge, S. V.....	Minneapolis	Moren, Edwin.....	Minneapolis
Carey, Jas. B.....	Minneapolis	Hoiland, A. S.....	Minneapolis	Moriarty, Cecile R.....	Minneapolis
Carlaw, Chester M.....	Minneapolis	Holen, T.....	Minneapolis	Morrison, A. W.....	Minneapolis
Chellean, S. J.....	Minneapolis	Holm, Geo. A.....	Minneapolis	Morse, John H.....	Minneapolis
Cirkler, A. A.....	Minneapolis	Huenkens, E. J.....	Minneapolis	Morton, H. McL.....	Minneapolis
Clark, Howard S.....	Minneapolis	Hughes, L. D.....	Minneapolis	Murphy, I. J.....	Minneapolis
Condit, W. H.....	Minneapolis	Hynes, James.....	Minneapolis	Murray, Wm. R.....	Minneapolis
Cook, H. W.....	Minneapolis	Hynes, John E.....	Minneapolis	Myers, J. A.....	Minneapolis
Corbett, J. Frank.....	Minneapolis	Iked, Kano.....	Minneapolis	Nathanson, M. H.....	Minneapolis
Cosman, E. O.....	Minneapolis	Irvine, H. G.....	Minneapolis	Neal, J. M.....	Minneapolis
Crafts, L. M.....	Minneapolis	Jennings, Mary H.....	Minneapolis	Nelson, C. P.....	Owatonna
Cranmer, Richard R.....	Minneapolis	Jensen, Louis C.....	Minneapolis	Nelson, H. S.....	Minneapolis
Cross, John G.....	Minneapolis	Jensen, M. J.....	Minneapolis	Nelson, O. E.....	Minneapolis
Crume, Geo. F.....	Minneapolis	Joannides, Minas.....	Minneapolis	Newhart, Horace.....	Minneapolis
Curtin, John F.....	Minneapolis	Johnson, A. E.....	Minneapolis	Nippert, L. A.....	Minneapolis
Cutts, Geo.....	Minneapolis	Johnson, A. Elof.....	Minneapolis	Noonan, Dan F.....	Minneapolis
Dahl, Elmer O.....	Minneapolis	Johnson, James A.....	Minneapolis	Nootnagel, C. F.....	Minneapolis
Dahl, John A.....	Minneapolis	Johnson, Julius.....	Minneapolis	Noran, A. N.....	Minneapolis
Daniel, Donald H.....	Minneapolis	Johnson, Nimrod A.....	Minneapolis	Nordin, G. T.....	Minneapolis
Dart, L. D.....	Minneapolis	Johnson, Odin J.....	Minneapolis	Nordland, Martin.....	Minneapolis
Dezell, Earl K.....	Minneapolis	Johnson, R. A.....	Minneapolis	Oberg, C. M.....	Minneapolis
Deziel, G.....	Minneapolis	Jones, G. M.....	Minneapolis	Odland, Henry.....	Minneapolis
Diehl, Harold S.....	Minneapolis	Jones, H. W.....	Minneapolis	O'Donnell, J. E.....	Minneapolis
Disen, C. F.....	Minneapolis	Jones, W. A.....	Minneapolis	Olson, Frederick A.....	Minneapolis
Doctor, Wm. R.....	Minneapolis	Joseph, Alex.....	Minneapolis	Olson, G. M.....	Minneapolis
Donaldson, C. A.....	Minneapolis	Kennedy, C. C.....	Minneapolis	Olson, Olaf A.....	Minneapolis
Dorge, Richard.....	Minneapolis	Kennedy, Jane F.....	Minneapolis	Olson, R. G.....	Minneapolis
Dornblaser, H. Bright.....	Minneapolis	Kennedy, R. R.....	Minneapolis	Owre, Oscar.....	Minneapolis
Doxey, G. L.....	Minneapolis	Kennedy, W. A.....	Minneapolis	Parks, A. H.....	Minneapolis
Drake, Chas. R.....	Minneapolis	Kimball, H. H.....	Minneapolis	Patterson, W. E.....	Minneapolis
Dreibach, N.....	Minneapolis	King, W. R.....	Minneapolis	Paulsen, E. L.....	Minneapolis
Dumas, Alex. G.....	Minneapolis	Kistler, A. J.....	Minneapolis	Pearce, N. O.....	Minneapolis
Dunn, Geo. Robt.....	Minneapolis	Kistler, C. M.....	Minneapolis	Pederson, Harold.....	Minneapolis
Dunn, Louis.....	Minneapolis	Knight, H. L.....	Minneapolis	Pederson, R. M.....	Minneapolis
Dunsmoor, F. A.....	Minneapolis	Knight, R. R.....	Minneapolis	Peppard, T. A.....	Minneapolis
Dutton, C. E.....	Minneapolis	Knight, Ralph T.....	Minneapolis	Perry, Ralph St. John.....	Minneapolis
Egilsrud, Kristian.....	Minneapolis	Koch, John C.....	Minneapolis	Peters, R. M.....	Minneapolis
Ehrenberg, C. J.....	Minneapolis	Kohler, Geo. A.....	Minneapolis	Petersen, J. R.....	Minneapolis
Eisler, R. Edw.....	Minneapolis	Koller, H. M.....	Minneapolis	Petersen, Thorvald.....	Minneapolis
Eitel, G. G.....	Minneapolis	Koller, L. R.....	Minneapolis	Peterson, O. H.....	Minneapolis
Ellison, D. E.....	Minneapolis	Kremer, Walter J.....	Minneapolis	Peterson, Willard C.....	Minneapolis
Erb, Fred A.....	Minneapolis	Kriedt, Daniel.....	Minneapolis		
Ericson, John G.....	Minneapolis	Kucera, Wm. J.....	Minneapolis		

Pettit, C. W. Minneapolis
 Peyton, Wm. T. Minneapolis
 Phelps, Kenneth A. Minneapolis
 Pineo, W. B. Minneapolis
 Poehler, F. T. Minneapolis
 Poppe, F. H. Minneapolis
 Pratt, Fred J. Minneapolis
 Pratt, J. A. Minneapolis
 Preine, Irving A. Minneapolis
 Prim, J. A. Minneapolis
 Proshek, C. E. Minneapolis
 Quinby, Thos. F. Minneapolis
 Quist, Henry W. Minneapolis
 Bavu, Bjarne Minneapolis
 Reed, Charles A. Minneapolis
 Rees, S. P. Minneapolis
 Regnier, E. A. Minneapolis
 Reinertson, E. R. Buffalo, S. D.
 Reynolds, J. S. Minneapolis
 Richdorf, L. F. Minneapolis
 Rishmiller, J. H. Minneapolis
 Rizer, R. I. Minneapolis
 Roan, Carl M. Minneapolis
 Robb, Edw. F. Minneapolis
 Roberts, Thos. S. Minneapolis
 Roberts, W. B. Minneapolis
 Robitshek, E. C. Minneapolis
 Rochford, W. E. Minneapolis
 Rodda, F. C. Minneapolis
 Rodgers, C. L. Minneapolis
 Rosen, S. Minneapolis
 Rosenwald, R. M. Minneapolis
 Rowe, Paul H. Minneapolis
 Sawatzky, Wm. A. Minneapolis
 Schaaf, Fred K. Minneapolis
 Schefcik, J. F. Minneapolis
 Scheldrup, N. H. Minneapolis
 Schlutz, F. W. Minneapolis
 Schmidt, Geo. F. Minneapolis
 Schmitt, Aaron F. Minneapolis
 Schmitt, S. C. Minneapolis

Schneider, J. P. Minneapolis
 Schussler, Otto F. Minneapolis
 Schwyzer, G. Minneapolis
 Seaberg, J. A. Minneapolis
 Seashore, Gilbert Minneapolis
 Seham, Max Minneapolis
 Simons, J. H. Minneapolis
 Simpson, Ellery D. Minneapolis
 Simpson, J. D. Minneapolis
 Sivertsen, Andrew Minneapolis
 Sivertsen, Ivar Minneapolis
 Slocumb, Maude Minneapolis
 Smith, Adam M. Minneapolis
 Smith, A. E. Minneapolis
 Smith, Homer R. Minneapolis
 Smith, Norman M. Minneapolis
 Soderlind, A. Minneapolis
 Souba, Fred. J. Minneapolis
 Spratt, C. N. Minneapolis
 Staples, H. L. Minneapolis
 Stewart, C. A. Minneapolis
 Stomel, Joseph Minneapolis
 Strachauer, A. C. Minneapolis
 Strout, E. S. Minneapolis
 Strout, G. Elmer Minneapolis
 Sundt, M. Minneapolis
 Swanson, Roy E. Minneapolis
 Sweetser, H. B. Minneapolis
 Sweetser, Theo. Minneapolis
 Sweetzer, S. E. Minneapolis
 Taft, J. O. Minneapolis
 Taft, Walter L. Minneapolis
 Tanner, Alvin C. Minneapolis
 Taylor, Rood Minneapolis
 Tennyson, Theo. Minneapolis
 Thomas, D. O. Minneapolis
 Thomas, Geo. E. Minneapolis
 Thomas, Geo. H. Minneapolis
 Thomas, Gilbert J. Minneapolis
 Thompson, Herb. H. Minneapolis
 Tingdale, A. C. Minneapolis

Towers, F. E. Minneapolis
 Turnacliff, D. D. Minneapolis
 Tyrrell, C. C. Minneapolis
 Ulrich, Henry L. Minneapolis
 Undine, Clyde A. Minneapolis
 Voyer, Emile O. Minneapolis
 Wanous, E. Z. Minneapolis
 Ward, A. W. Minneapolis
 Ward, Percy Minneapolis
 Warham, T. T. Minneapolis
 Watson, C. W. Minneapolis
 Watson, J. A. Minneapolis
 Webb, R. C. Minneapolis
 Weisman, Sam Minneapolis
 Welles, H. J. Minneapolis
 Weston, C. G. Minneapolis
 Wethall, A. G. Minneapolis
 Weum, T. W. Minneapolis
 Whetstone, Mary Minneapolis
 White, S. Marx Minneapolis
 White, Willard D. Minneapolis
 Widen, W. F. Minneapolis
 Wilcox, Archa E. Minneapolis
 Wilcox, M. Russell Minneapolis
 Willcutt, Clarence Minneapolis
 Williams, Robert Minneapolis
 Willson, Hugh S. Minneapolis
 Wittich, F. W. Minneapolis
 Wohlrahe, A. A. Minneapolis
 Wood, Douglas F. Minneapolis
 Woodard, F. R. Minneapolis
 Woodworth, Elizab. Minneapolis
 Wright, C. B. Minneapolis
 Wright, C. D. Minneapolis
 Wright, F. R. Minneapolis
 Wynne, H. M. N. Minneapolis
 Yoerg, O. W. Minneapolis
 Zaworski, E. A. Minneapolis
 Zierold, A. A. Minneapolis
 Ziskin, Thos. Minneapolis

Wright County Medical Society

Regular meetings, first Tuesday after first Monday quarterly
 Annual meeting, October

President
 Roholt, C. L. Waverly
 Secretary
 Catlin, John J. Buffalo
 Catlin, John J. Buffalo
 Ellison, Frank Monticello

Freed, O. J. R. Cokato
 Harriman, L. Howard Lake
 Hawkins, E. P. Montrose
 Klaveness, E. Monticello
 Lee, J. L. Watertown
 Moffatt, A. G. Howard Lake
 Norris, G. H. Annandale
 Peterson, O. L. Cokato

Phillips, A. E. Delano
 Ridgway, A. M. Annandale
 Roholt, C. L. Waverly
 Rousseau, Victor Maple Lake
 Shrader, E. E. Watertown
 Sturges, C. J. Buffalo
 Thoresen, Th. Brooklyn, N. Y.
 Werner, O. S. St. Hilaire

Meeker County Medical Society

Annual meeting, December

President
 Sturre, J. H. Watkins
 Secretary
 Danielson, K. A. Litchfield

Brigham, Frank Watkins
 Cutts, G. A. C. Litchfield
 Danielson, K. A. Litchfield
 Dulude, S. Dassel
 O'Connor, D. C. Eden Valley

Peterson, Alfred Dassel
 Robertson, A. W. Litchfield
 Robertson, W. P. Litchfield
 Sturre, J. R. Watkins

Stearns-Benton County Medical Society

Regular meetings, third Thursday in January, April, July and October
 Annual meeting, third Thursday in April

President
 Watson, Tolbert Albany
 Secretary
 Libert, J. N. St. Cloud
 Ausman, Carl F. Paynesville
 Beebe, W. L. St. Cloud
 Beaty, James H. St. Cloud
 Boehm, John C. St. Cloud
 Bowing, I. E. St. Cloud
 Brigham, C. F. St. Cloud
 Clark, Harry B. St. Cloud
 Du Bois, Julian A. Sauk Center
 Du Bois, Julian F. Sauk Center
 Freeman, W. L. Foley
 Friesleben, Wm. Sauk Rapids
 Moynihan, And. F. Sauk Center

Gelz, J. J. St. Cloud
 Goehrs, H. W. St. Cloud
 Gulde, W. C. St. Cloud
 Haberman, E. Osakis
 Hemstead, Werner St. Cloud
 Holdridge, G. A. Foley
 Kern, M. J. St. Cloud
 Kingsbury, E. M. Clearwater
 Kohler, D. W. St. Joseph
 Kuhlman, Aug. Melrose
 Lewis, E. J. St. Cloud
 Lewis, C. B. St. Cloud
 Libert, J. N. St. Cloud
 McDowell, J. P. St. Cloud
 McKibben, H. E. St. Cloud
 Meyer, A. A. Melrose

Pfaff, E. K. Los Angeles
 Pilon, P. C. Paynesville
 Putney, George E. Paynesville
 Rathbun, A. M. Rice
 Rathbun, C. A. St. Cloud
 Rice, G. D. St. Cloud
 Richardson, Fred S. Belgrade
 Richter, E. H. Hunter, N. D.
 Ridgeway, Alex. Belgrade
 Sherwood, G. E. Kimball
 Stangl, Fred St. Cloud
 Stangl, P. E. St. Cloud
 Sutton, Chas. S. St. Cloud
 Sweetman, R. H. Sauk Center
 Watson, Tolbert Albany
 Walner, Oscar H. Gilbert

Kandiyohi-Swift County Medical Society

Regular meetings, quarterly, as called by the President
 Annual meeting, December

President
 Johnson, Hans Kerkhoven
 Secretary
 Scofield, C. L. Benson
 Anderson, R. E. Willmar

Branton, A. F. Willmar
 Branton, B. J. Willmar
 Daignault, O. Benson
 Davison, P. C. Willmar
 Dowswell, W. J. Benson
 Frost, E. H. Willmar
 Hodapp, J. R. Willmar

Jacobs, Jno. C. Willmar
 Johnson, H. Kerkhoven
 Kaufman, Wm. Appleton
 Kolset, Carl D. Benson
 Little, D. W. Appleton
 Rains, John M. Willmar
 Scofield, C. L. Benson

FIFTH DISTRICT

COUNCILOR, H. M. WORKMAN (2 years) Tracy

Camp Release District Medical Society

Renville, Chippewa, Lac Qui Parle, Yellow Medicine and Sibley Counties

Regular meetings, fourth Thursday in January, April, July and October

Annual meeting, fourth Thursday in October

President

Adams, R. C. Bird Island

Secretary

Peterson, H. E. Granite Falls

Adams, R. C. Bird Island
 Aldrich, F. H. Belview
 Bacon, R. S. Montevideo
 Barfield, J. J. Granite Falls
 Bergh, L. N. Montevideo
 Brand, W. A. Redwood Falls
 Burns, M. A. Milan
 Bushey, M. E. Arlington
 Clay, E. M. Renville

Cole, H. B. Redwood Falls
 Crandall, A. M. Madison
 Cress, E. E. Boyd
 Eisengraeber, G. A. Granite Falls
 Englehart, P. C. Wood Lake
 Flinn, B. P. Redwood Falls
 Flinn, T. E. Redwood Falls
 Flower, W. Z. Minneapolis
 Frisch, Frank P. Gibbon
 Gaines, E. C. Buffalo Lake
 Guyer, L. G. Nopeming
 Hauge, M. M. Clarkfield
 Johnson, C. M. Dawson
 Johnson, H. M. Dawson

Lee, W. N. Madison
 Lima, Ludvig Montevideo
 Mesker, G. H. Olivia
 Olson, W. P. Gaylord
 Paser, A. A. Olivia
 Penhall, F. W. Morton
 Peterson, H. E. Granite Falls
 Puffer, F. L. Bird Island
 Sanderson, A. G. Granite Falls
 Sherman, H. T. Franklin
 Smith, L. G. Montevideo
 Stemsrud, A. A. Dawson
 Westby, N. Madison
 Zimbeck, R. D. Maynard

Redwood-Brown County Medical Society

Annual meeting, June

President

Juergens, H. M. Sanborn

Secretary

Meierding, Wm. A. Springfield

Adams, J. L. Morgan
 Cosgriff, J. A. Lamberton
 Dubbe, F. H. New Ulm
 Eckstein, A. W. Comfrey
 Fritsche, A. New Ulm
 Fritsche, L. A. New Ulm
 Gray, F. D. Marshall

Hammermeister, Theo. F.
 New Ulm
 Haskins, J. L. Northfield
 Jamieson, Earl. Walnut Grove
 Juergens, H. M. Sanborn
 Kiefer, M. A. Sleepy Eye
 Meierding, Wm. A. Springfield
 Pederson, O. J. Hanska
 Peterson, R. A. Vesta
 Reinecke, George F. New Ulm
 Rothenburg, J. C. Springfield

Schoch, J. L. New Ulm
 Seifert, Otto J. New Ulm
 Shrader, J. S. Springfield
 Strickler, A. F. Sleepy Eye
 Strickler, Mary Sleepy Eye
 Strickler, O. C. New Ulm
 Vogel, Jos. H. New Ulm
 Vogel, M. A. Minneapolis
 Walker, C. C. Raymond
 Weiser, Geo. B. New Ulm
 Wellcome, J. W. B. Sleepy Eye

Lyon-Lincoln County Medical Society

Regular meetings, first Tuesday in March, May and July

Annual meeting, October

President

Robertson, J. B. Cottonwood

Secretary

Workman, H. M. Tracy

Akester, Ward Marshall
 Bossingham, O. N. Lake Benton

Engh, Sigfred Cottonwood
 Ford, Burton C. Marshall
 Germo, Chas. Balaton
 Hoidale, A. D. Tracy
 Jacobsen, David J. Russell
 Jacquot, G. L. Tyler
 Jensen, J. C. Hendricks
 McCoy, J. E. Ivanhoe

Persons, C. E. Marshall
 Robertson, J. B. Cottonwood
 Sanderson, E. T. Minneota
 Thordarson, Theo. Minneota
 Vadheim, A. L. Tyler
 Valentine, W. H. Tracy
 Workman, H. M. Tracy
 Workman, W. G. Tracy

SIXTH DISTRICT

COUNCILOR, F. R. WEISER (3 years) Windom

Southwestern Minnesota Medical Society

Pipestone, Rock, Murray, Nobles, Cottonwood, and Jackson Counties

Regular meetings, May and October

Annual meeting, October

President

Balcom, G. Lake Wilson

Secretary

Piper, Wm. A. Mountain Lake

Arnold, E. W. Adrian
 Atkins, G. L. Jackson
 Balcom, G. Lake Wilson
 Basinger, Harvey R.
 Mountain Lake
 Bong, J. H. Jasper
 Brown, A. H. Pipestone
 Chadbourn, A. G. Heron Lake
 Cress, P. J. Ellsworth
 De Boer, Herman. Edgerton
 Ditmeier, L. M. Gerber. Jasper
 Dolan, C. P. Worthington
 Doms, H. C. Slayton
 Doms Wm. Woodstock

Dudley, J. H. Windom
 Golden, C. M. Tyler
 Halloran, Walter Jackson
 Hilger, J. M. Iona
 Hitchings, W. S. Lakefield
 Johnson, Ellsworth Windom
 Keeling, F. L. Lakefield
 Lowe, Thos. Pipestone
 McCrea, Jas. Fulda
 McKeown, E. G. Pipestone
 Manson, F. M. Worthington
 May, C. C. Adrian
 Metcalf, F. W. Fulda
 Mork, B. O. Worthington
 Nusbaum, W. H. Storm Lake, Ia.
 Patterson, W. E. Westbrook
 Piper, Wm. A. Mountain Lake
 Portman, W. C. Jackson

Richardson, W. E. Pipestone
 Richmond, Chas. D. Jeffers
 Rose, J. F. Lakefield
 Sherman, C. L. Luverne
 Slater, S. A. Worthington
 Smallwood, J. F. Worthington
 Sogge, L. Windom
 Stanley, C. R. Worthington
 Stanly, Wm. J. Pipestone
 Thorson, E. O. Luverne
 Tiedeman, E. J. Adrian
 Tiedeman, I. D. Heron Lake
 Tofte, Josephine Minneapolis
 Waller, Jas. D. Wilmont
 Watson, F. G. Worthington
 Weiser, F. R. Windom
 Williams, L. A. Slayton
 Wright, C. O. Luverne

Blue Earth Valley Medical Society

Martin and Faribault Counties

Regular meetings, 4th Thursday, May and October

Annual meeting, May

President
Hunte, A. F. Truman
Secretary
Hunt, R. C. Fairmont
Bailey, H. B. Ceylon
Best, F. E. Wells
Broberg, J. A. Blue Earth
Butz, J. A. Monterey
Chambers, W. C. Blue Earth

Cooper, M. D. Winnebago
Dewey, G. W. Fairmont
Gough, W. H. Granada
Henderson, A. J. Kiester
Holm, P. Wells
Herman, S. Welcome
Hunt, F. N. Fairmont
Hunt, R. C. Fairmont
Hunte, A. F. Truman
Jacobs, A. C. Elmore

Johnson, H. P. Fairmont
Logan, F. W. Blue Earth
Lowe, R. C. Fairmont
Luedtke, G. H. Fairmont
McGroarty, J. J. Easton
Mills, J. W. Winnebago City
Richardson, W. J. Fairmont
Sybilrud, H. W. Bricelyn
Wilson, C. E. Blue Earth

Watsonwan County Medical Society

Annual meeting, December

President
Ternstrom, O. H. Minneapolis
Secretary
Grimes, H. B. Madelia

Bregel, F. L. St. James
Grimes, H. B. Madelia
Hagen, O. E. Butterfield
Kabrick, O. A. Odin

McCarthy, W. J. Madelia
Ternstrom, O. H. Minneapolis
Thompson, Albert St. James

SEVENTH DISTRICT

COUNCILOR, F. A. DODGE, M. D. (1 year) Le Sueur

Nicollet-Le Sueur County Medical Society

Regular meetings, September and December

Annual meeting, December

President
Behmler, Fred. W. Lafayette
Secretary
Le Clerc, J. E. Le Sueur
Aitkens, H. B. Le Sueur Center
Baskett, Geo. T. St. Peter
Baskett, Olive T. St. Peter

Behmler, Fred W. Lafayette
Covell, W. W. St. Peter
Daniels, J. W. St. Peter
Dodge, F. A. Le Sueur
Ericson, S. Le Sueur
Fisher, J. M. St. Peter
Hartung, H. A. Le Sueur

Le Clerc, J. E. Le Sueur
McDougald, D. W. Minneapolis
Meilicke, W. A. Nicollet
Phelps, R. M. St. Peter
Smith, D. F. St. Peter
Strathern, F. P. St. Peter
Woodworth, L. F. Le Sueur Center

McLeod County Medical Society

Regular meetings, quarterly

Annual meeting, September

President
Schmidt, W. R. Glencoe
Secretary
Axilrod, D. L. Hutchinson
Axilrod, D. L. Hutchinson
Bolles, D. W. Long Beach, Cal.
Clair, J. B. Winsted

Kohler, F. G. Minneapolis
Clement, J. B. Lester Prairie
Crowe, E. R. Green Isle
Engstrond, O. J. Brownston
Holm, H. H. Glencoe
Jellison, E. R. New Auburn
Klima, W. W. Stewart

Langhoff, A. H. Glencoe
Saar, W. G. Hutchinson
Schmidt, W. R. Glencoe
Scholpp, O. W. Hutchinson
Sheppard, Fred Hutchinson
Sheppard, P. E. Hutchinson
Trutna, Thos. Silver Lake

Scott-Carver Medical Society

Regular meetings, first Thursday in March, June, September and December

Annual meeting, first Thursday in December

President
Bohland, F. J. von ... Belle Plaine
Secretary
Reiter, H. W. Shakopee
Bohland, F. J. von ... Belle Plaine
Buck, Fred H. Shakopee

Fischer, H. P. Shakopee
Fischer, P. M. Shakopee
Henriksen, H. G. Elko
Landsberger, John. New Prague
McKeon, James. St. Paul
Maertz, W. P. New Prague
Meyer, P. S. Belle Plaine

Moloney, G. R. Belle Plaine
Morris, F. J. New Prague
Novak, Edw. E. New Prague
Phillips, Wm. H. Jordan
Reiter, H. W. Shakopee
Schneider, H. A. Jordan

Goodhue County Medical Society

Annual meeting, first Tuesday in January

President
Aanes, A. M. Red Wing
Secretary
Smith, M. W. Red Wing
Aanes, A. M. Red Wing
Anderson, J. V. Red Wing

Anderson, S. H. Red Wing
Claydon, L. E. Red Wing
Conley, Alva. Cannon Falls
Cremer, M. H. Red Wing
Gausemel, S. D. Goodhue
Johnson, A. E. Red Wing
Jones, A. W. Red Wing

Kretschmar, K. E. Minneapolis
McGuigan, H. T. Red Wing
Sawyer, H. P. Red Wing
Smith, M. W. Red Wing
Steffens, L. A. Red Wing
Werner, N. L. Red Wing

Rice County Medical Society

Regular meetings quarterly as called
Annual meeting, December

President
Babcock, F. M. Northfield
Secretary
Robilliard, C. M. Faribault
Babcock, F. M. Northfield
Davis, F. U. Faribault
Field, Merton Northfield
Haessly, S. B. Faribault
Hanson, A. M. Faribault

Huxley, F. R. Faribault
Kanne, C. W. Faribault
Lee, W. P. Northfield
Lexa, F. J. Lonsdale
McBroom, D. E. Faribault
Mayland, M. L. Faribault
Morse, W. E. H. Morristown
Moses, Joseph, Jr. Northfield
Plonske, C. J. Faribault
Robilliard, C. M. Faribault

Robilliard, W. H. Faribault
Rumpf, C. W. Faribault
Rumpf, W. H. Faribault
Smith, P. A. Faribault
Theissen, W. N. Faribault
Traeger, C. A. Faribault
Warren, F. S. Faribault
Warren, J. W. Faribault
Wilson, Warren Northfield

Wabasha County Medical Society

Regular meetings, annually first Thursday after first Monday in July

President
Replogle, W. H. Wabasha
Secretary
Wilson, W. F. Lake City
Bayley, E. H. Lake City

Cochrane, W. J. Lake City
Dempsey, D. P. Kellogg
Fleischhauer, D. S. Wabasha
French, E. A. Plainview
Gutsell, R. S. Zumbro Falls

Radabaugh, R. C. Hastings
Replogle, W. H. Wabasha
Slocumb, J. A. Plainview
Sutton, L. F. Mazeppa
Wilson, W. F. Lake City

EIGHTH DISTRICT

COUNCILOR, W. F. BRAASCH, M. D. (3 years) Rochester

Blue Earth County Medical Society

Regular meetings, last Monday in each month
Annual meeting, last Monday in December

President
Edwards, Ralph T. Elysian
Secretary
Osborn, Lida Mankato
Andrews, John W. Mankato
Andrews, Roy N. Mankato
Arnold, James E. Vernon Center
Benham, Edward W. Mankato
Black, William Mankato
Dahl, Gerhard A. Mankato
Denman, Austin V. Mankato
Edwards, Ralph T. Elysian

Franchere, Fred W. Lake Crystal
Fugina, Geo. R. Madison Lake
Hielscher, Helen H. Mankato
Hielscher, Julian A. Mankato
Holbrook, John S. Mankato
Holman, Carl J. Mankato
James, John H. Mankato
Kelly, Thos. C. Mankato
Kemp, Alphonse F. Mankato
Liedloff, Adolph G. Mankato
Lloyd, Hiram J. Mankato
Merrill, James E. Amboy
Miller, Victor Mankato

O'Connor, Patrick H. Amboy
Osborn, Lida Mankato
Pratt, Chelsea C. Mankato
Schlesselman, George Good Thunder
Schlesselman, J. T. Mankato
Schmidt, Paul F. Mapleton
Snell, Albert M. Rochester
Sohmer, Alphonse E. J. Mankato
Wentworth, Albert J. Mankato
Williams, Hugh O. Lake Crystal
Williams, John Lake Crystal

Houston-Fillmore County Medical Society

Regular meetings, May and October
Annual meeting, October

President
Helland, G. M. Spring Grove
Secretary
Fischer, O. F. Houston
Anderson, Norman E. Harmony
Browning, W. E. Caledonia
Christianson, H. W. Wykoff
Clifton, Theo. A. Chatfield
Collins, J. S. Wabasha
Drake, F. A. Lanesboro

Eby, Cyrus B. Spring Valley
Fischer, O. F. Houston
Helland, G. M. Spring Grove
Helland, J. W. Spring Grove
Johnson, C. H. Spring Valley
Kibbe, O. A. Canton
Kierland, P. E. Alexandria
Lannin, J. C. Mabel
Love, Geo. A. Preston
Nannestad, R. F. Lanesboro

Nass, H. A. Mabel
Nelson, M. S. Spring Grove
Ongard, C. K. Halstad
Ongard, L. K. Houston
Rhines, D. C. Caledonia
Sather, E. R. Alexandria
Tierney, C. M. Granger
Utley, J. D. Glendale, Cal.
Williams, R. V. Rushford
Woodruff, C. W. Chatfield

Mower County Medical Society

Regular meetings, last Thursday of every month
Annual meeting, November

President
Allen, C. C. Austin
Secretary
Lommen, P. A. Austin
Allen, A. W. Austin
Allen, C. C. Austin
Cobb, Willis F. Lyle

Coleman, F. B. Austin
Grise, W. B. Austin
Hegge, C. A. Austin
Hegge, O. H. Austin
Henslin, A. E. LeRoy
Hertel, G. E. Austin
Leck, C. C. Austin
Lommen, P. A. Austin

Melzer, G. R. Lyle
Morris, E. H. Austin
Morse, M. P. LeRoy
Schottler, G. J. Dexter
Shipley, H. M. Adams
Torkelson, P. T. Lyle
Warren, C. L. LeRoy

Dodge County Medical Society

No regular meetings
Annual meeting in August

President
Harrison, E. E. West Concord
Secretary
Bigelow, C. E. Dodge Center

Adams, R. T. Mantorville
Baker, Amos L. Kasson
Belt, Wallace E. Dodge Center
Bigelow, Chas. E. Dodge Center
Clifford, Frank F. West Concord

Flores, O. T. Dodge Center
Harrison, Elmer E. West Concord
Smith, Frank D. Kasson
Way, Osman F. Claremont

Olmsted County Medical Society

Regular meetings, second Wednesday in April, June, September and December
Annual meeting, second Wednesday in December

President

Sistrunk, W. E. Rochester

Secretary

Piper, M. C. Rochester

Abrams, W. D. Rochester
Adams, S. Franklin Rochester
Adson, Alfred W. Rochester
Allen, Wilson A. Rochester
Amberg, Samuel Rochester
Anderson, C. M. Rochester
Anderson, John G. . . . Rochester
Ashury, Elsie Rochester
Ashury, J. T. Rochester
Balfour, Donald C. . . . Rochester
Barborka, C. J. Rochester
Bargen, J. Arnold Rochester
Barnes, A. R. Rochester
Barrier, Chas. W. . . . Rochester
Becker, Samuel Wm. . . Rochester
Behn, Claud W. Rochester
Benedict, William L. . . Rochester
Benjamin, W. G. Rochester
Bergen, Ralph D. . . . Rochester
Berkman, David M. . . Rochester
Bleifus, Walter F. . . . Rochester
Bliss, John Herbert . . Rochester
Bonta, M. B. Rochester
Boothby, Walter M. . . Rochester
Bothe, Fred A. Rochester
Bowling, Harry H. . . Rochester
Bowler, John Pollard . Rochester
Braasch, William F. . . Rochester
Broders, Albert C. . . Rochester
Brown, George E. . . . Rochester
Brown, P. W. Rochester
Brown, R. O. Rochester
Bryan, A. W. Rochester
Bucerman, Winifred Henry . . Rochester

Buie, L. A. Rochester
Bumpus, Herman C. . . Rochester
Burden, Verne G. . . . Rochester
Burns, J. G. Rochester
Camp, John Dexter . . Rochester
Carman, Russell Daniel . Rochester
Cathcart, E. P. Rochester
Chaney, W. C. Rochester
Cobb, Donnell B. . . . Rochester
Collins, Harry A. . . . Rochester
Comfort, M. W. Rochester
Conner, H. M. Rochester
Craig, Wm. McK. . . . Rochester
Crane, W. W. Jr. . . . Rochester
Crawford, Albert S. . . Rochester
Crenshaw, John L. . . Rochester
Crewe, John E. Rochester
Culligan, J. M. Rochester
Culligan, L. C. Rochester
Daly, Joseph Rochester
Davis, A. C. Rochester
Davis, Kenneth S. . . . Rochester
Delamere, G. D. . . . Rochester
Desjardines, Arthur U. Rochester
Dixon, C. F. Rochester
Dixon, R. K. Rochester
Dobson, Herbert Victor . Rochester
Dolder, Felix C. Eyota
Drips, D. G. Rochester
Dunlap, H. F. Rochester
Eager, B. F. Rochester
Ebert, Joseph William . Rochester
Eustenlaub, G. H. . . . Rochester
Esterman, Geo. B. . . Rochester
Evarts, Arrah B. . . . Rochester
Faust, L. S. Rochester
Fawcett, Chas. E. . . . Stewartville
Figl, F. A. Rochester
Finney, W. P. Rochester

Ford, Frances A. . . . Rochester
Forsberg, Carl Wm. . . Rochester
Foucar, H. O. Rochester
Fowler, L. H. Rochester
Freed, C. F. Rochester
Gaarde, Fred W. . . . Rochester
Garvin, John Day . . . Rochester
Giffin, H. Z. Rochester
Gilliam, R. M. Rochester
Gipner, J. F. Rochester
Goeckerman, W. H. . . Rochester
Granger, Charles T. . . Rochester
Green, Carl Hartley . . Rochester
Hager, B. H. Rochester
Haines, S. F. Rochester
Hallberg, C. A. . . . Rochester
Hallenbeck, Dorr F. . . Rochester
Hanson, W. Arthur . . Rochester
Harding, D. B. . . . Rochester
Harrington, S. W. . . Rochester
Hartman, Howard R. . Rochester
Hauser, E. D. W. . . Rochester
Hedblom, Carl A. . . Rochester
Helmholz, H. F. . . . Rochester
Hempstead, B. E. . . Rochester
Hench, Philip S. . . . Rochester
Henderson, Melvin S. . Rochester
Hendricks, Wm. A. . . Rochester
Herbst, William P. . . Rochester
Heyerdale, Oscar C. . Rochester
Holloway, J. K. . . . Rochester
Houck, K. H. Rochester
Huffman, L. D. . . . Rochester
Hunt, Verne C. . . . Rochester
Hyer, C. A. Rochester
Jepson, P. N. Rochester
Johnson, A. C. . . . Rochester
Jones, H. T. Rochester
Joyce, George T. . . . Rochester
Judd, Edward Starr . . Rochester
Keiser, V. D. Rochester
Keith, N. M. Rochester
Kennedy, Roger L. J. . Rochester
Kent, George B. . . . Rochester
Kernohan, J. W. . . . Rochester
Kilbourne, Arthur F. . Rochester
Kilfoy, E. J. Rochester
Kilgore, Allen M. . . Rochester
Kilgore, F. H. . . . Rochester
Knight, Mary S. . . . Rochester
Koucky, J. D. . . . Rochester
Larson, E. Eric . . . Rochester
Latchford, J. K. . . Rochester
Leech, Chas. Hoyt . . Rochester
Lemon, Willis S. . . Rochester
Lillie, Harold I. . . Rochester
Linton, William B. . . Rochester
Logan, Archibald H. . Rochester
Long, W. H. Rochester
Luden, Georgine . . Rochester
Lyday, R. O. . . . Rochester
Lyons, Shirley C. . . Rochester
McGuire, L. D. . . . Rochester
McKaig, Carle B. . . Rochester
McVicar, Chas. S. . . Rochester
Magath, T. B. . . . Rochester
Mahle, A. E. Rochester
Mailer, Robert . . . Rochester
Malloy, J. F. . . . Rochester
Marsh, Fred Eugene . Rochester
Marquis, W. James . . Rochester
Masson, D. M. . . . Rochester
Masson, James C. . . Rochester
Mayfield, A. L. . . . Rochester
Mayo, Charles H. . . Rochester
Mayo, William J. . . Rochester
Maytum, C. K. . . . Rochester
Mebane, Donald Cummins . Rochester

Meeker, W. R. Rochester
Melson, Oliver C. . . Rochester
Mentzer, S. H. . . . Rochester
Merrill, U. H. . . . Rochester
Meyerding, Henry W. . Rochester
Moersch, Frederick P. . Rochester
Moersch, H. J. . . . Rochester
Moore, Alex. B. . . . Rochester
Moran, Robert E. . . Rochester
Morse, Harry D. . . . Rochester
Muhme, N. B. . . . Rochester
Murphy, A. B. . . . Rochester
Mussey, Robert B. . . Rochester
Nagel, G. W. . . . Rochester
Nelson, Marquee O. . Rochester
Nesbit, Harold T. . . Rochester
New, Gordon B. . . . Rochester
Nixon, S. H. . . . Rochester
Offutt, Susan R. . . Rochester
Ollinger, Lorin B. . . Rochester
O'Leary, Paul A. . . Rochester
Parker, E. R. . . . Rochester
Parker, H. L. . . . Rochester
Parker, J. William . . Rochester
Pemberton, John deJ. . Rochester
Peterman, M. G. . . Rochester
Piper, Monte C. . . Rochester
Plankers, A. G. . . Rochester
Plummer, H. S. . . Rochester
Plummer, W. A. . . Rochester
Pollock, Lee W. . . Rochester
Potter, J. C. . . . Rochester
Powell, L. D. . . . Rochester
Prangen, Avery D. . . Rochester
Proctor, O. S. . . . Rochester
Pulford, DeLos Schuyler (Jr.) . . Rochester

Reid, J. Spruce . . . Rochester
Rivers, A. B. . . . Rochester
Robertson, H. E. . . Rochester
Rockwood, Paul Reed . Rochester
Rohwer, C. J. . . . Rochester
Rosenow, Edward C. . Rochester
Rowntree, L. G. . . Rochester
Sanford, Arthur H. . Rochester
Sargeant, Howard L. . Rochester
Schmitt, E. O. G. . . Rochester
Scholl, A. J. . . . Rochester
Seed, Linton . . . Rochester
Shaffer, Loren W. . . Rochester
Sheldon, Walter D. . Rochester
Sistrunk, Walter E. . Rochester
Smith, F. L. . . . Rochester
Sprunt, William H. . Rochester
Stacy, Leda June . . Rochester
Stark, W. B. . . . Rochester
Steven, George . . . Byron
Stevens, J. B. . . . Rochester
Stinson, J. W. . . Rochester
Stokes, John H. . . Rochester
Sutherland, C. G. . Rochester
Swan, Theo. S. . . Rochester
Taylor, R. V. . . . Rochester
Vinson, Porter P. . Rochester
Von Lackum, W. H. . Rochester
Wagener, H. P. . . Rochester
Wahle, Geo. H. . . Rochester
Walters, H. W. . . Rochester
Wangensteen, Owen H. Rochester
Webber, I. M. . . Rochester
Weir, J. F. . . . Rochester
Wilder, Russell M. . Rochester
Wilhelm, L. F. X. . Rochester
Wilkins, J. A. . . Rochester
Williamson, Carl S. . Rochester
Willius, Frederick A. . Rochester
Wilson, Louis B. . . Rochester
Witherstine, H. H. . Rochester
Woltman, Henry W. F. Rochester
Yoakem, H. H. . . Rochester

Waseca County Medical Society

Annual meeting, December

President

Miller, H. A. Waseca

Secretary

Gallagher, B. J. . . . Waseca

Blanchard, H. G. . . . Waseca

Brandenburg, F. D. . Crystal Bay
Chamberlin, W. A. . . Waseca
Cory, W. M. . . . Waterville
Gallagher, B. J. . . . Waseca
Hagen, H. O. . . . New Richland
Joyce, T. M. . . . Janesville

Leopard, B. A. . . . New Richland
Lynn, J. F. . . . Waseca
McIntire, H. M. . . Waseca
Miller, H. A. . . . Waseca
O'Hara, J. J. . . . Janesville
Swartwood, F. A. . . Waseca

Winona County Medical Society

Regular meetings, first Tuesday in January, April, July, October
Annual meeting in January

President		
Schaefer, S.	Winona	
Secretary		
Robbins, C. P.	Winona	
Adler, S. W.	Winona	
Baer, H. C.	St. Charles	
Benoit, F. T.	Winona	
Clay, F. H.	St. Charles	
Heise, W. F. C.	Winona	
Keyes, E. D.	Winona	
Leicht, O.	Winona	
Lichtenstein, H.	Winona	
Lindsay, W. V.	Winona	
McLaughlin, E. M.	Winona	
Nauth, W. H.	Winona	
Neumann, C. A.	Lewiston	
Pritchard, D. B.	Winona	
Risser, E. D.	Winona	
Robbins, C. P.	Winona	
Rosenberry, B. P.	Winona	
Schaefer, S.	Winona	
Scott, J. N.	St. Charles	
Steiner, I. W.	Winona	
Tweedy, G. J.	Winona	

Freeborn County Medical Society

Regular meetings upon call of members
Annual meeting, November

President		
Von Berg, J. P.	Albert Lea	
Secretary		
Folken, F. G.	Albert Lea	
Burns, H. D.	Albert Lea	
Buturff, C. R.	Freeborn	
Calhoun, F. W.	Albert Lea	
Folken, F. G.	Albert Lea	
Freeman, J. R.	Glenville	
Gamble, J. W.	Albert Lea	
Gullixson, A.	Albert Lea	
Kamp, E. A.	Albert Lea	
King, W. L.	Albert Lea	
Nannestad, J. R.	Albert Lea	
Odegard, B. O.	Emmons	
Palmer, C. F.	Albert Lea	
Palmer, W. L.	Albert Lea	
Shultz, J. A.	Albert Lea	
Vollum, E. O.	Albert Lea	
Von Berg, J. P.	Albert Lea	

Steele County Medical Society

Regular meetings, second alternate Tuesday of each month
Annual meeting, December

President		
Smersh, J. F.	Owatonna	
Secretary		
Hart, A. B.	Owatonna	
Andrist, J. W.	Owatonna	
Gamble, R. M.	Ellendale	
Hart, A. B.	Owatonna	
McIntyre, J. A.	Owatonna	
Melby, B.	Blooming Prairie	
Peterson, C.	Owatonna	
Quigley, T. C.	Owatonna	
Senn, E. W.	Owatonna	
Smersh, F. M.	Owatonna	
Smersh, J. F.	Owatonna	
Stewart, A. B.	Owatonna	

ALPHABETICAL ROSTER

Aanes, A. M. Red Wing
 Abbott, A. W. Minneapolis
 Abbott, J. S. St. Paul
 Abbott, Wm. P. Duluth
 Ahorn, W. H. Hawley
 Abramovich, J. H. St. Paul
 Abrams, W. D. Rochester
 Adair, F. L. Minneapolis
 Adams, B. S. Hibbing
 Adams, J. L. Morgan
 Adams, R. C. Bird Island
 Adams, Rollin T. Mantorville
 Adams, S. Franklin. . . . Rochester
 Adkins, C. M. Grygla
 Adler, S. W. Winona
 Adson, A. W. Rochester
 Agnew, Allen T. International Falls

Ahrens, A. E. St. Paul
 Ahrens, A. H. St. Paul
 Aitkens, H. B. Le Sueur Center
 Akester, Ward Marshall
 Alden, J. F. St. Paul
 Aldes, Harry St. Paul
 Aldrich, F. H. Belview
 Alexander, F. H. St. Paul
 Ailing, C. P. Minneapolis
 Allen, A. W. Austin
 Allen, C. C. Austin
 Allen, F. A. Crosby
 Allen, F. H. Staples
 Allen, H. W. Minneapolis
 Allen, Mason St. Paul
 Allen, W. A. Rochester
 Allison, R. G. Minneapolis
 Amberg, Samuel Rochester
 Anderson, A. E. Minneapolis
 Anderson, A. G. Minneapolis
 Anderson, C. M. Rochester
 Anderson, David D. . . . Minneapolis
 Anderson, Edward D. . . Minneapolis
 Anderson, Hilding C. . . . Duluth
 Anderson, John G. . . . Rochester
 Anderson, J. K. Deerwood
 Anderson, J. V. Red Wing
 Anderson, Norman E. . . . Harmony
 Anderson, R. E. Willmar
 Anderson, S. H. Red Wing
 Anderson, W. T. St. Paul
 Andrist, J. W. Owatonna
 Annis, H. B. Minneapolis
 Archihald, Frank M. . . . Mahnomen
 Arends, A. L. St. Paul
 Arey, H. C. Excelsior
 Arminem, K. V. Duluth
 Armstrong, E. L. Duluth
 Armstrong, J. M. St. Paul
 Arnold, E. W. Adrian
 Arnold, James E. Vernon Center
 Arnquist, A. S. St. Paul
 Arnsen, J. M. Graceville
 Arouni, Khalil St. Paul
 Arvidson, C. G. Minneapolis
 Artz, C. P. St. Paul
 Asbury, Eslie. Rochester
 Asbury, J. T. Rochester
 Athens, A. S. Buhl
 Atkins, G. L. Jackson
 Aune, Martin Minneapolis
 Aurdand, W. H. Minneapolis
 Aurness, P. A. Minneapolis
 Ausman, C. F. Paynesville
 Avery, J. Fowler Minneapolis
 Axilrod, D. L. Hutchinson
 Aylmer, A. L. Minneapolis
 Ayres, G. T. Ely
 Babcock, F. M. Northfield
 Bacon, Donald K. St. Paul
 Bacon, Knox St. Paul
 Bacon, L. C. St. Paul
 Bacon, R. S. Montevideo
 Badeaux, G. L. Brainerd
 Baer, H. C. St. Charles
 Bagley, W. R. Duluth
 Baier, Florence C. Minneapolis
 Bailey, H. B. Ceylon
 Baker, A. C. Fergus Falls
 Baker, A. L. Kasson
 Baker, Alfred T. Minneapolis
 Baker, E. L. Minneapolis
 Baker, Looe Minneapolis
 Bakke, O. H. Minneapolis
 Balcom, G. G. Lake Wilson
 Balcome, F. E. St. Paul
 Baldwin, L. B. Minneapolis
 Balfour, D. C. Rochester
 Ball, C. R. St. Paul

Bank Harry E. Minneapolis
 Barber, J. P. Minneapolis
 Barborka, C. J. Rochester
 Barden, Norman Minneapolis
 Barfield, J. J. Granite Falls
 Barges, J. Arnold Rochester
 Barnes, A. R. Rochester
 Barney, L. A. Duluth
 Barrett, Fred Gilbert
 Barrier, Chas. W. Rochester
 Barron, Moses. Minneapolis
 Barry, L. W. St. Paul
 Barsness, Nellie. St. Paul
 Basinger, Harvey L. Mountain Lake

Baskett, Geo. T. St. Peter
 Baskett, Olive T. St. Peter
 Bass, G. W. Minneapolis
 Bates, B. V. Wheaton
 Baxter, S. H. Minneapolis
 Bayley, E. H. Lake City
 Beadie, W. D. Cannon Falls
 Beals, Hugh St. Paul
 Beard, Archie H. Minneapolis
 Beaty, J. H. St. Cloud
 Beaudoux, Henry A. . . . Minneapolis
 Becker, S. W. Rochester
 Beckley, F. L. St. Paul
 Bedford, E. W. Minneapolis
 Beebe, W. L. St. Cloud
 Behmler, Fred W. Lafayette
 Behn, Claud W. Rochester
 Beise, R. A. Brainerd
 Bell, C. C. St. Paul
 Bell, J. W. Minneapolis
 Bell, J. W., Jr. Minneapolis
 Belt, W. E. Dodge Center
 Benedict, E. E. Minneapolis
 Benedict, W. L. Rochester
 Benepe, L. M. St. Paul
 Benham, E. W. Mankato
 Benjamin, A. E. Minneapolis
 Benjamin, W. G. Rochester
 Benn, F. G. Minneapolis
 Bennion, P. H. St. Paul
 Benoit, F. T. Winona
 Benson, R. D. Minneapolis
 Bentley, Norman P. . . . St. Paul
 Berdez, G. L. Duluth
 Bergen, Otto Clinton
 Bergen, Ralph D. Rochester
 Bergh, L. N. Montevideo
 Berghelm, M. C. Hawley
 Berquist, K. E. Duluth
 Berkman, D. M. Rochester
 Berrisford, Paul D. . . . St. Paul
 Bertelson, O. L. Crookston
 Bessenes, A. N. Minneapolis
 Bessenes, Al. N., Jr. . . . Minneapolis
 Bessenes, Daniel H. . . . Minneapolis
 Bessenes, W. A. Minneapolis
 Best, F. E. Wells
 Bigelow, C. E. Dodge Center
 Binet, H. E. Grand Rapids
 Binger, H. E. St. Paul
 Birnberg, T. L. St. Paul
 Bishop, Chas. W. Minneapolis
 Bissell, F. S. Minneapolis
 Black, William Mankato
 Blacklock, S. S. Hibbing
 Blake, James Hopkins
 Blakely, C. C. Barnum
 Blanchard, H. G. Waseca
 Bleifuss, W. F. Rochester
 Bliss, John H. Rochester
 Bock, R. A. St. Paul
 Bockman, M. W. H. . . . Minneapolis
 Boeckmann, Eduard. . . . St. Paul
 Boeckmann, Egil. St. Paul
 Boehm, J. C. St. Cloud
 Bohland, E. H. St. Paul
 Bohland, F. J. von. . . . Belleplaine
 Bohling, B. S. Sandstone
 Bole, R. S. St. Paul
 Boleyn, E. S. Stillwater
 Bolles, D. W. Long Beach, Calif.
 Bolsta, Chas. Ortonville
 Bolstad, H. C. St. Paul
 Boman, P. G. Duluth
 Bone, Merle Kelliher
 Bong, J. H. Jasper
 Bonta, M. E. Rochester
 Booth, A. E. Minneapolis
 Boothby, W. M. Rochester
 Boquist, E. T. W. Minneapolis
 Boreen, C. A. Minneapolis
 Bossert, C. S. Rochester

Bossingham, O. N. . . . Lake Benton
 Bosworth, Robinson. . . . St. Paul
 Bothe, F. A. St. Paul
 Bottolfson, B. T. Moorhead
 Bouman, H. A. Minneapolis
 Bowen, R. L. Hibbing
 Bowing, H. H. Rochester
 Bowing I. E. St. Cloud
 Bowler, John Pollard. . . Rochester
 Boyer, S. H. Duluth
 Boysen, P. Pelican Rapids
 Braasch, Wm. F. Rochester
 Brabeck, F. J. Perham
 Bracken, H. M. New York City
 Braden, A. J. Duluth
 Bradley, E. L. Duluth
 Brand, G. D. St. Paul
 Brand, W. A. Redwood Falls
 Brandenburg, F. D. . . . Crystal Bay
 Branton, A. F. Willmar
 Branton, B. J. Willmar
 Bratrud, A. E. Minneapolis
 Bratrud O. E. Warren
 Bratrud, Theo. Warren
 Bray, C. W. Biawabik
 Bray, E. R. St. Paul
 Bregel, F. L. St. James
 Brigham, C. F. St. Cloud
 Brigham, Frank Watkins
 Briggs, F. W. Duluth
 Brimhall, J. B. St. Paul
 Broberg, J. A. Blue Earth
 Broders, A. C. Rochester
 Brodie, Walter D. St. Paul
 Broker, W. S. Batle Lake
 Brooks, Chas. N. Minneapolis
 Brooks, D. F. St. Paul
 Brooks, G. F. St. Paul
 Brown, A. E. Stillwater
 Brown, A. H. Pipestone
 Brown, Edgar D. Minneapolis
 Brown, Ed. L. St. Paul
 Brown, Edw. J. Minneapolis
 Brown, G. E. Rochester
 Brown, John C. St. Paul
 Brown, LeRoy St. Paul
 Brown, P. W. Rochester
 Brown, R. O. Rochester
 Brown, R. S. Minneapolis
 Browning, W. E. Caledonia
 Brunkow, C. W. Minneapolis
 Bryan, A. W. Rochester
 Buck, Fred H. Shakopee
 Buerman, W. H. Rochester
 Buie, L. A. Rochester
 Bulkley, Kenneth. . . . Minneapolis
 Bullen, F. W. Hibbing
 Bumpus, H. C. Rochester
 Burch, F. E. St. Paul
 Burden, Verne G. Rochester
 Burdick, G. H. St. Paul
 Burnap, W. L. Fergus Falls
 Burns, F. W. St. Paul
 Burns, H. D. Albert Lea
 Burns, H. J. Duluth
 Burns, J. G. Rochester
 Burns, M. A. Milan
 Burns, R. L. Two Harbors
 Burns, R. M. St. Paul
 Buscher, H. St. Paul
 Bushey, M. E. Arlington
 Butler, John Minneapolis
 Butler, A. J. Hackensack
 Butturff, C. R. Freeborn
 Butz, J. A. Monterey
 Byrnes, W. J. Minneapolis
 Cabot, V. S. Minneapolis
 Caine, A. T. Anoka
 Caine, C. E. Morris
 Caldwell, K. S. St. Paul
 Caley, G. R. Princeton
 Calhoun, F. W. Albert Lea
 Calkins, L. A. Minneapolis
 Cameron, Angus L. . . . Minneapolis
 Cameron, J. A. St. Paul
 Camp, John Dexter. . . . Rochester
 Camp, W. E. Minneapolis
 Campbell, D. R. Bagley
 Campbell, J. E. South St. Paul
 Campbell, L. M. Minneapolis
 Campbell, Robert Minneapolis
 Cannon, Harry St. Paul
 Cantwell, W. F. Internat'l Falls
 Carey, James B. Minneapolis
 Carlaw, C. M. Minneapolis
 Carman, C. L. St. Paul
 Carman, Paul L. St. Paul

Carman, Russell D.	Rochester	Daly, Joseph	Rochester	Eklund, Wm. J.	Duluth
Carroll, Wm. C.	St. Paul	Daniel, Donald H.	Minneapolis	Elias, F. J.	Duluth
Carstens, C. F.	Hibbing	Daniels, H. A.	Eveleth	Ellison, David E.	Minneapolis
Cathcart, E. P.	Rochester	Daniels, J. W.	St. Paul	Ellison, Frank E.	Monticello
Catlin, John J.	Buffalo	Daniels, W. H.	Crookston	Elsey, J. R.	Glenwood
Catlin, T. J.	Palisade	Danielson, K. A.	Litchfield	Ely, O. S.	South St. Paul
Cavanaugh, J. O.	St. Paul	Darling, J. B.	St. Paul	Engberg, E. J.	St. Paul
Chadbourne, A. G.	Heron Lake	Darrow, D. C.	Moorhead	Engelhart, P. C.	Wood Lake
Chamberlin, W. A.	Waseca	Dart, Leslie O.	Minneapolis	Engh, Sigfred	Cottonwood
Chambers, W. C.	Blue Earth	Daugherty, E. B.	St. Paul	Engstrom, A. J.	Brownston
Chandler, O. B.	St. Paul	Daugherty, L. E.	St. Paul	Eppard, R. M.	Cloquet
Chaney, W. C.	Rochester	Davis, A. C.	Rochester	Erb, F. A.	Minneapolis
Chapman, T. L.	Duluth	Davis, B. F.	Duluth	Ericson, J. G.	Minneapolis
Chatterton, C. C.	St. Paul	Davis, F. U.	Faribault	Ericson, Swan	Le Sueur
Cheleen, S. J.	Minneapolis	Davis, Herbert	St. Paul	Ernest, G. C.	St. Paul
Cheney, E. L.	Duluth	Davis, H. S.	Duluth	Eshelby, E. C.	St. Paul
Christensen, E. P.	Two Harbors	Davis, Kenneth S.	Rochester	Espenlaub, G. H.	Rochester
Christiansen, A.	St. Paul	Davis, Lloyd T.	Wadena	Esser, John	Perham
Christianson, H. W.	Wykoff	Davis, T. C.	Wadena	Estrem, C. O.	Fergus Falls
Christie, G. R.	Long Prairie	Davis, William	St. Paul	Estrem, T. A.	Hibbing
Christie, R. L.	Long Prairie	Davison, P. C.	Willmar	Eusterman, G. B.	Rochester
Christison, J. T.	St. Paul	DeBoer, Hermann	Edgerton	Evarts, Arrah B.	Rochester
Cirkler, A. A.	Minneapolis	DeDolph, Karl	St. Paul	Everlof, J. L.	Minneapolis
Clair, J. B.	Winsted	Delamere, G. D.	Rochester	Evert, J. A.	St. Paul
Clark, F. F.	Duluth	Delmore, J. L.	Roseau	Ewens, H. B.	Virginia
Clark, H. B.	St. Cloud	Demsey, D. P.	Kellogg	Ewing, C. F.	Wheaton
Clark, H. S.	Minneapolis	Denman, A. V.	Mankato	Fahey, E. W.	St. Paul
Clark, T. C.	Minneapolis	Derauf, B. L.	Brainerd	Fansler, W. A.	Minneapolis
Clay, E. M.	Renville	Desjardins, Arthur U.	Rochester	Farr, R. E.	Minneapolis
Clay, F. H.	St. Charles	Dewey, G. W.	Fairmont	Faust, L. S.	Rochester
Claydon, L. E.	Red Wing	Dezell, Earl R.	Minneapolis	Fawcett, C. E.	Stewartville
Clement, J. B.	Lester Prairie	Deziel, G.	Minneapolis	Feidt, W. W.	Minneapolis
Clifford, F. E.	West Concord	Dickson, Thos. H., Jr.	St. Paul	Ferguson, J. C.	St. Paul
Clifton, Theo.	Chatfield	Diehl, H. S.	Minneapolis	Ferreira, G. J.	Aurora
Cobb, Donnell B.	Rochester	Disen, C. F.	Minneapolis	Fessler, Harold H.	St. Paul
Cobb, S. G.	St. Paul	Dittmeier, L. M. Gerber	Jasper	Field, Merton	Northfield
Cobb, Willis F.	Lyle	Dittman, Geo. C.	St. Paul	Figli, F. A.	Rochester
Cochrane, W. J.	Lake City	Dixon, Claude F.	Rochester	Finney, W. P.	Rochester
Colby, Woodard	St. Paul	Dixon, J. F.	Carlton	Fischer, G.	Minneapolis
Cole, H. B.	Redwood Falls	Dixon, R. K.	Rochester	Fischer, H. P.	Shakopee
Cole, Wallace H.	St. Paul	Dobson, H. V.	Rochester	Fischer, O. F.	Houston
Coleman, F. B.	Austin	Doctor, Wm. R.	Minneapolis	Fischer, P. M.	Shakopee
Collie, H. G.	St. Paul	Dodge, F. A.	Le Sueur	Fisher, J. M.	St. Peter
Collins, A. N.	Duluth	Dohm, A. J.	St. Paul	Fitzgerald, E. T.	Morris
Collins, Harry A.	Rochester	Dolan, C. P.	Worthington	Fjeldstad, C. Alford	Minneapolis
Collins, H. C.	Duluth	Dolder, F. C.	Eyota	Fjellman, R. C.	Minneapolis
Collins, J. S.	Wabasha	Doms, H. C.	Slayton	Flagstad, A. E.	St. Paul
Colvin, A. R.	St. Paul	Doms, Wm.	Woodstock	Fleischhauer, D. S.	Wabasha
Comfort, M. W.	Rochester	Donaldson, C. A.	Minneapolis	Fleming, A. S.	Minneapolis
Comstock, A. E.	St. Paul	Donohue, P. F.	St. Paul	Fleming, C. Filmore	Minneapolis
Condit, W. H.	Minneapolis	Doolittle, L. E.	Duluth	Fleming, James	Cloquet
Conley, Alva A.	Cannon Falls	Dorge, Richard L.	Minneapolis	Flinn, B. P.	Redwood Falls
Conner, H. M.	Rochester	Dornblaser, H. Bright	Minneapolis	Flinn, T. E.	Redwood Falls
Conner, Wm. H.	St. Paul			Floeken, Chas. F.	Minneapolis
Connor, C. E.	St. Paul			Flom, A. O.	Chicago City
Cook, Henry Wireman	Minneapolis			Flores, O. T.	Dodge Center
		Douglas, H. E.	Blackduck	Flower, W. Z.	Minneapolis
Cook, Paul B.	St. Paul	Douglass, J. E.	State Sanatorium	Fogarty, Chas. W.	St. Paul
Cooney, H. C.	Princeton	Dowsey, W. J.	Benson	Foley, F. E. B.	St. Paul
Cooper, M. D.	Winnepago City	Doxey, G. L.	Minneapolis	Folken, F. G.	Albert Lea
Corbett, J. Frank	Minneapolis	Doyle, Geo. C.	Duluth	Forbes, R. S.	Duluth
Corrigan, J. E.	Spoonerville	Drake, Carl B.	St. Paul	Ford, B. C.	Marshall
Cory, W. M.	Waterville	Drake, C. R.	Minneapolis	Ford, Frances A.	Rochester
Cosgriff, J. A.	Lamberton	Drake, F. A.	Lanesboro	Forrest, C. G.	Clearbrook
Cosgrove, J. H.	Duluth	Dredge, H. P.	Sandstone	Forsberg, C. W.	Rochester
Cosman, E. O.	Minneapolis	Drenning, F. C.	Duluth	Foucar, H. O.	Rochester
Countryman, Roger S.	St. Paul	Driesbach, N.	Minneapolis	Fowler, L. H.	Rochester
Courtney, Walter	Brainerd	Drips, D. G.	Rochester	Fox, John M.	Minneapolis
Covell, W. W.	St. Peter	Drought, W. W.	Fergus Falls	Franchere, F. W.	Lake Crystal
Covenry, W. A.	Duluth	Dryden, F. M.	Crookston	Franzen, H. G.	Minneapolis
Cowern, E. W.	North St. Paul	Dubbe, F. H.	New Ulm	Freeborn, J. A.	Fergus Falls
Cowing, P. G.	Evansville	DuBois, J. A.	Sauk Center	Freed, C. F.	Rochester
Crafts, Leo M.	Minneapolis	DuBois, J. F.	Sauk Center	Freed, O. J. R.	Cokato
Craig, C. C.	Internat'l Falls	Dudley, J. H.	Windom	Freeman, C. D.	St. Paul
Craig, Wm. McK.	Rochester	Dulude, S.	Dassel	Freeman, J. P.	Glenville
Crandall, A. M.	Madison	Dumas, Alexander	Minneapolis	Freeman, W. L.	Foley
Crandall, Wm.	Graceville	Dunlap, H. F.	Rochester	Freiligh, E. O'B.	Stillwater
Crane, Wm. W., Jr.	Rochester	Dunlop, A. H.	Crookston	French, E. A.	Plainview
Cranmer, Richard R.	Minneapolis	Dunn, Geo. Robt.	Minneapolis	Freymler, E. F.	Cloverton
Crawford, Albert S.	Rochester	Dunn, J. N.	St. Paul	Friesleben, Wm.	Sauk Rapids
Cremer, M. H.	Red Wing	Dunn, Louis	Minneapolis	Frisch, F. P.	Richmond
Crenshaw, J. L.	Rochester	Dunsmoor, F. A.	Minneapolis	Fritsche, Albert	New Ulm
Cress, E. E.	Boyd	Durgin, F. L.	Nopeming	Fritsche, L. A.	New Ulm
Cress, P. J.	Ellsworth	Dutton, C. E.	Minneapolis	Froehlich, H. W.	Thief River Falls
Crew, J. E.	Rochester	Eager, B. F.	Rochester	Frost, E. H.	Willmar
Cross, J. G.	Minneapolis	Earl, George A.	St. Paul	Fuerste, Frederick	Proctor
Crowe, E. R.	Green Isle	Earl, Robert O.	St. Paul	Fugina, George R.	Madison Lake
Crowe, J. H.	Virginia	Eberlin, E. A.	Glenwood	Fulton, J. F.	St. Paul
Crowl, Verne C.	Bertha	Ebert, Joseph William	Rochester	Furber, W. W.	Cottage Grove
Crume, Geo. P.	Minneapolis	Eby, C. B.	Spring Valley	Gaarde, F. W.	Rochester
Culligan, J. M.	Rochester	Eckman, P. F.	Duluth	Gager, E. C.	St. Paul
Culligan, Leo C.	Rochester	Eckstein, A. W.	Comfrey	Gaines, E. C.	Buffalo Lake
Curtin, John F.	Minneapolis	Eduard, G.	St. Paul	Gallagher, B. J.	Waseca
Cutts, G. A. C.	Litchfield	Edwards, Ralph T.	Elysian	Gamble, J. W.	Albert Lea
Cutts, George	Minneapolis	Egilsrud, K.	Minneapolis	Gamble, R. M.	Ellendale
Cyr, A.	Barnesville	Ehmke, Wm. E.	Willow River	Gammell, J. H.	Minneapolis
		Ehrenberg, C. J.	Minneapolis	Gardner, D. G.	St. Paul
Dack, Lloyd G.	St. Paul	Eisenraeber, G. A.	Granite Falls	Gardner, Edwin L.	Minneapolis
Dahl, Elmer O.	Minneapolis			Gardner, R. D.	Eveleth
Dahl, G. A.	Mankato	Eisenman, W. G.	Chisholm	Garlock, A. V.	Bemidji
Dahl, John A.	Minneapolis	Eisler, Edw. R.	Minneapolis	Garlock, D. H.	Bemidji
Daignault, O.	Benson	Eitel, G. G.	Minneapolis		
		Ekblad, J. W.	Duluth		

Garvin, John Day.....	Rochester	Hamlin, Geo. B.....	Minneapolis	Hoit, E. E.....	Detroit
Gates, C. E.....	Anoka	Hammermeister, Theo. F.....	New Ulm	Holbrook, J. S.....	Mankato
Gausemel, S. D.....	Goodhue	Hammes, E. M.....	St. Paul	Holcomb, J. T.....	St. Paul
Gauthier, W.....	Virginia	Hammond, J. F.....	St. Paul	Holcomb, O. W.....	St. Paul
Geer, Everett K.....	St. Paul	Hand, W. R.....	Elbow Lake	Holcridge, Geo.....	Foley
Geissenger, John D.....	St. Paul	Haney, C. L.....	Duluth	Hollen, T.....	Minneapolis
Geist, Emil S.....	Minneapolis	Hannah, H. B.....	Minneapolis	Holl, P. M.....	Minneapolis
Geist, George A.....	St. Paul	Hansen, Erling.....	Minneapolis	Hollands, W. H.....	Fisher
Gelz, J. J.....	St. Cloud	Hansen, Olga S.....	Minneapolis	Holloway, J. K.....	Rochester
Gendron, J. F.....	Grand Rapids	Hanson, A. M.....	Faribault	Holloway, J. K.....	Rochester
Gerber, Milo P.....	Brainerd	Hanson, W. Arthur.....	Rochester	Holm, Geo. A.....	Minneapolis
Germo, Chas.....	Balaton	Harding, D. B.....	Rochester	Holm, H. H.....	Glencoe
Geyman, M. J.....	Browerville	Hare, E. R.....	Minneapolis	Holm, P. F.....	Wells
Ghent, C. Harry.....	St. Paul	Harriman, L.....	Howard Lake	Holman, C. J.....	Mankato
Ghent, M. M.....	St. Paul	Harrington, C. D.....	Minneapolis	Holman, E. E.....	Pine River
Ghostley, Mary C.....	Internat'l Falls	Harrington, F. E.....	Minneapolis	Holst, C. F.....	Little Falls
Gibbon, L. O.....	St. Paul	Harrington, S. W.....	Rochester	Holst, J. B.....	Little Falls
Giere, E. O.....	St. Paul	Harris, C. N.....	Nashauk	Holte, Halvor.....	Crookston
Glessler, Paul W.....	Minneapolis	Harrison, E. E.....	West Concord	Houck, K. H.....	Rochester
Giffin, H. Z.....	Rochester	Hart, A. B.....	Owatonna	Houze, Z. E.....	Cass Lake
Gilbert, John D.....	Carlton	Hartman, H. R.....	Rochester	Houston, C. A.....	Park Rapids
Gilfillan, J. S.....	St. Paul	Hartung, H. A.....	Le Sueur	Hovde, H.....	Duluth
Gilles, F. L.....	Minneapolis	Hartzell, Thos. B.....	Minneapolis	Howard, M. A.....	St. Paul
Gillespie, M. G.....	Duluth	Haskell, A. D.....	Alexandria	Howard, Wm. H.....	Minneapolis
Gillespie, N. H.....	Duluth	Haskins, John L.....	Northfield	Howard, W. S.....	St. Paul
Gilliam, R. M.....	Rochester	Hastings, D. R.....	Duluth	Huenekens, E. J.....	Minneapolis
Gilmore, R.....	Bemidji	Hatch, W. E.....	Duluth	Huffman, L. D.....	Rochester
Ginsberg, Wm.....	St. Paul	Haugan, O. M.....	Fergus Falls	Hughes, Louis D.....	Minneapolis
Gipner, J. F.....	Rochester	Hauge, M. M.....	Clarkfield	Hullsiek, H. E.....	St. Paul
Giroux, A. A.....	Duluth	Haugen, G. T.....	Fergus Falls	Hultkrans, Joel C.....	St. Paul
Goeckerman, W. H.....	Rochester	Hauser, E. D. W.....	Rochester	Humphrey, E. W.....	Moorhead
Goehrs, H. W.....	St. Cloud	Hauser, V. P.....	St. Paul	Humphrey, W. R.....	Stillwater
Golden, C. M.....	Tyler	Haverfield, Addie K.....	Minneapolis	Hunt, F. N.....	Fairmont
Goltz, E. V.....	St. Paul	Hawkins, E. P.....	Montrose	Hunt, H. E.....	St. Paul
Goodheart, C. J.....	Akeley	Hawkins, V. J.....	St. Paul	Hunt, R. C.....	Fairmont
Goodman, C. E.....	Virginia	Hayes, J. M.....	Minneapolis	Hunt, V. C.....	Rochester
Goodson, Catherine M.....	Retreat, Pa.	Hayes, M. F.....	Nashauk	Hunte, A. F.....	Truman
Gordon, Geo. J.....	Minneapolis	Head, G. D.....	Minneapolis	Hurst, M. M.....	Grand Rapids
Gosin, D. F.....	Minneapolis	Healy, R. T.....	Pierz	Huxley, F. R.....	Faribault
Goss, Harold.....	Minneapolis	Hearn, Wm. O.....	Minneapolis	Hvoslef, Jakob.....	Internat'l Falls
Gosslee, G. L.....	Moorhead	Heath, A. C.....	St. Paul	Hyer, C. A.....	Rochester
Gotham, C. L.....	St. Paul	Hedback, A. E.....	Minneapolis	Ilynes, James.....	Minneapolis
Gough, W. H.....	Granada	Hedblom, C. A.....	Rochester	Ilynes, John E.....	Minneapolis
Graham, David.....	Duluth	Hegge, C. A.....	Austin	Ide, A. W.....	St. Paul
Graham, R. D.....	Duluth	Hegge, O. H.....	Austin	Ikedo, Kano.....	Minneapolis
Graham, Robert.....	Duluth	Heim, Russell R.....	Minneapolis	Ingerson, C. A.....	St. Paul
Granger, C. T.....	Rochester	Heimark, J. H.....	Moorhead	Irvine, H. G.....	Minneapolis
Gratzek, Thos.....	St. Paul	Heimark, O. E.....	Duluth	Jacobs, A. C.....	Elmore
Grave, Floyd.....	Minneapolis	Heise, W. F. C.....	Winona	Jacobs, John C.....	Willmar
Graves, Carlton.....	Aitkin	Helk, H. H.....	Minneapolis	Jacobson, David J.....	Russell
Grawn, F. A.....	Duluth	Helland, G. M.....	Spring Grove	Jacquot, G. L.....	Tyler
Gray, C. E.....	Rush City	Helland, J. W.....	Spring Grove	James, J. H.....	Mankato
Gray, F. D.....	Marshall	Helmholz, H. F.....	Rochester	Jameson, Earl.....	Walnut Grove
Greeley, L. Q.....	Duluth	Hempstead, B. E.....	Rochester	Jellison, E. R.....	New Auburn
Green, E. K.....	Minneapolis	Hemstead, Werner.....	St. Cloud	Jennings, Mary H.....	Minneapolis
Greene, Carl Hartley.....	Rochester	Hench, Philip S.....	Rochester	Jensen, J. C.....	Hendricks
Greene, Charles L.....	St. Paul	Henderson, A. J.....	Kiester	Jensen, Louis C.....	Minneapolis
Griffin, P. J.....	Detroit	Henderson, M. S.....	Rochester	Jensen, M. J.....	Minneapolis
Grimes, H. B.....	Madelia	Hendricks, Wm. A.....	Rochester	Jensen, T. J.....	Duluth
Grise, W. B.....	Austin	Hendrickson, J. F.....	Minneapolis	Jepson, P. N.....	Rochester
Groll, S. B.....	Minneapolis	Hengstler, W. H.....	St. Paul	Jesio, J. W.....	St. Paul
Ground, H. T.....	Virginia	Henney, W. H.....	McIntosh	Joannides, Minas.....	Minneapolis
Grover, F. E.....	Duluth	Henriksen, H. G.....	Elko	Johnson, A. C.....	Rochester
Gruenhagen, Arnold P.....	St. Paul	Henry, C. E.....	Minneapolis	Johnson, A. E.....	Minneapolis
Gulde, W. C.....	St. Cloud	Henry, Myron O.....	Minneapolis	Johnson, A. E.....	Red Wing
Gullixson, A. A.....	Albert Lea	Hensel, C. N.....	St. Paul	Johnson, A. Elof.....	Minneapolis
Gunderson, Harley J.....	Minneapolis	Henslin, A. E.....	LeRoy	Johnson, Asa M.....	St. Paul
Gunderson, Nels A.....	Minneapolis	Herbst, William P.....	Rochester	Johnson, C. H.....	Spring Valley
Gunderson, R. M.....	Lake Park	Herman, S.....	Welcome	Johnson, C. M.....	Dawson
Gunz, A. N.....	Center City	Herrmann, Edgar T.....	St. Paul	Johnson, Ellsworth.....	Windom
Gutsell, R. S.....	Zumbro Falls	Heron, Roy C.....	St. Paul	Johnson, E. W.....	Bemidji
Guyer, L. G.....	Nopeming	Hertel, G. E.....	Austin	Johnson, Hans.....	Kerkhoven
Habein, Harold C.....	Minneapolis	Hesseltine, Verner.....	Taylor's Falls	Johnson, Hartland C.....	St. Paul
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Hacking, Frank H.....	Minneapolis	Heyerdale, O. C.....	Rochester	Johnson, H. P.....	Fairmont
Haessley, S. B.....	Faribault	Hiebert, J. P.....	Minneapolis	Johnson, James A.....	Minneapolis
Hagaman, Geo. K.....	St. Paul	Hicks, F. A.....	Grand Marais	Johnson, Julius.....	Minneapolis
Hagen, G. L.....	Minneapolis	Hielscher, Helen H.....	Mankato	Johnson, Nimrod.....	Minneapolis
Hagen, H. O.....	New Richland	Hielscher, Julian A.....	Mankato	Johnson, Odin J.....	Minneapolis
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Hagen, O. J.....	Moorhead	Hilger, A. W.....	St. Paul	Johnson, R. A.....	Minneapolis
Hager, B. H.....	Rochester	Hilger, D. D.....	St. Paul	Johnson, T. H.....	St. Paul
Haggard, G. D.....	Minneapolis	Hilger, J. M.....	St. Paul	Johnson, Walfred.....	Stillwater
Haight, G. G.....	Audubon	Hill, Eleanor J.....	Minneapolis	Jones, A. W.....	Red Wing
Haines, J. H.....	Stillwater	Hill, Frederick E.....	Duluth	Jones, E. M.....	St. Paul
Haines, S. F.....	Rochester	Hirschboeck, F. J.....	Duluth	Jones, G. M.....	Minneapolis
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Hall, A. R.....	St. Paul	Hitchings, W. S.....	Lakefield	Jones, W. A.....	Minneapolis
Hall, E. L.....	Princeton	Hoaglund, A. W.....	Minneapolis	Josewich, Alex.....	Minneapolis
Hall, J. M.....	Minneapolis	Hobbs, C. A.....	Minneapolis	Josewski, R. J.....	Stillwater
Hall, P. M.....	State Sanatorium	Hodapp, R. J.....	Willmar	Joyce, G. T.....	Rochester
Hallberg, C. A.....	Rochester	Hodge, S. V.....	Minneapolis	Joyce, T. M.....	Janesville
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Halloran, Walter.....	Jackson	Hoff, Alfred.....	St. Paul	Juergens, H. M.....	Sanborn
Hallowell, W. H.....	Minneapolis	Hoff, Peder.....	St. Paul	Kabrisk, O. A.....	Odin
Halper, Philip.....	St. Paul	Hoffman, Max H.....	St. Paul	Kahala, A. A.....	Crookston
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Hamilton, A. S.....	Minneapolis			Kannary, E. L.....	St. Paul
				Kanne, C. W.....	Faribault

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Kean, N. D.	Coleraine	Leibold, H. H.	Parkers Prairie	McKaig, Carle B.	Pine Island
Keeling, Louis F.	Lakefield	Leicht, O.	Winona	McKeon, James	St. Paul
Keiser, V. D.	Rochester	Leitch, Archibald	St. Paul	McKeon, Owen	St. Paul
Keith, N. M.	Rochester	Leland, John T.	Herman	McKeown, E. G.	Pipestone
Kelly, B. W.	Aitkin	Leland, M. N.	Minneapolis	McKibben, H. E.	St. Cloud
Kelly, John V.	St. Paul	Lemon, W. S.	Rochester	McKinlay, C. A.	Minneapolis
Kelly, Paul H.	St. Paul	Lemstrom, Jarl	Minneapolis	McKinley, J. C.	Minneapolis
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Kemp, A. F.	Mankato	Lepak, F. J.	Duluth	McLaughlin, E. M.	Winona
Kennedy, C. C.	Minneapolis	Lepak, John A.	St. Paul	McLaughlin, Jos. A.	Minneapolis
Kennedy, Jane F.	Minneapolis	Lerche, William	St. Paul	McMurtrie, W. B.	Marble
Kennedy, R. L. J.	Rochester	Leuty, Amos	Morris	McNevin, C. F.	St. Paul
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Kennedy, W. A.	Minneapolis	Lewis, C. B.	St. Cloud	McPheeters, H. O.	Minneapolis
Kent, George B.	Rochester	Lewis, E. J.	St. Cloud	McVicar, Chas. S.	Rochester
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Kerlan, S. Z.	McGregor	Lewis, J. D.	Minneapolis	MacDonald, D. A.	Minneapolis
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Kesting, Herman	St. Paul	Libert, John	St. Cloud	Macnie, J. S.	Minneapolis
Keyes, C. R.	Duluth	Lichtenstein, H.	Winona	Maertz, W. F.	New Prague
Keyes, E. D.	Winona	Lick, C. L.	St. Paul	Magath, T. B.	Rochester
Kibbe, O. A.	Canton	Liedloff, A. G.	Mankato	Magie, W. H.	Duluth
Kiefer, M. A.	Sleepy Eye	Lillie, H. I.	Rochester	Magney, F. H.	Duluth
Kierland, P. E.	Alexandria	Lillie, W. I.	Rochester	Mahle, A. E.	Rochester
Kiesling, I. H.	Nashauk	Lima, Ludvig	Montevideo	Mailier, Robert	Rochester
Kilbourne, A. F.	Rochester	Lind, C. J.	Minneapolis	Malland, C. O.	Minneapolis
Kilfoy, E. J.	Rochester	Linde, Herman	Cyrus	Malloy, J. F.	Rochester
Kilgore, A. M.	Rochester	Lindgren, E. I.	Duluth	Maloney, T. J.	St. Paul
Kilgore, F. H.	Rochester	Lindsay, W. V.	Winona	Manley, J. R.	Duluth
Kimball, H. H.	Minneapolis	Linton, W. B.	Rochester	Mann, A. T.	Minneapolis
King, Walter E.	St. Paul	Lippman, H. S.	Minneapolis	Manson, F. M.	Worthington
King, W. I.	Albert Lea	List, Walter E.	Minneapolis	Marley, W. J.	Minneapolis
King, W. R.	Minneapolis	Litchfield, John T.	Minneapolis	Marcum, E. H.	Bemidji
King, W. S.	Eveleth	Litman, Samuel N.	Meadowlands	Mariette, Ernest	Hopkins
Kingsbury, E. M.	Clearwater	Little, D. W.	Appleton	Mark, D. B.	Minneapolis
Kistler, A. J.	Minneapolis	Little, W. J.	St. Paul	Marquis, W. J.	Rochester
Kistler, A. S.	St. Paul	Litzenberg, J. C.	Minneapolis	Marsh, F. E.	Rochester
Kistler, C. M.	Minneapolis	Lloyd, H. J.	Mankato	Martin, T. E.	Duluth
Kittelston, T. N.	Fergus Falls	Locken, O. E.	Crookston	Martineau, J. L.	St. Paul
Klavness, E.	Monticello	Logan, A. H.	Rochester	Masson, D. M.	Rochester
Klein, Harry	Duluth	Logan, F. W.	Blue Earth	Masson, J. C.	Rochester
Klein, H. N.	St. Paul	Logeheil, R. C.	Minneapolis	Matchan, Glen R.	Minneapolis
Klima, W. W.	Stewart	Lommen, P. A.	Austin	Mathews, Justus	Minneapolis
Knapp, F. N.	Duluth	Long, Jesse	Minneapolis	Mattill, P. M.	Oak Terrace
Knapp, M. K.	St. Paul	Long, W. H.	Rochester	Maxeiner, Stanley R.	Minneapolis
Knight, H. L.	Minneapolis	Loofbourrow, E. H.	Keewatin	May, C. C.	Adrian
Knight, Mary S.	Rochester	Loomis, E. A.	Minneapolis	May, W. H.	Minneapolis
Knight, Ralph T.	Minneapolis	Love, Fred A.	Carlos	Mayfield, A. L.	Rochester
Knight, Ray Roberts	Minneapolis	Love, Geo. A.	Preston	Mayland, M. L.	Faribault
Koch, John Charles	Minneapolis	Lowe, L. M.	Glyndon	Mayo, C. H.	Rochester
Kohlbray, C. O.	Duluth	Lowe, R. C.	Fairmont	Mayo, W. J.	Rochester
Kohler, D. W.	St. Joseph	Lowe, Thos.	Pipestone	Maytum, C. K.	Rochester
Kohler, F. G.	Minneapolis	Ludine, Georgine	Rochester	Mead, Marion	Minneapolis
Kohler, G. A.	Minneapolis	Luedtke, G. H.	Fairmont	Mebane, D. C.	Rochester
Koller, Herman M.	Minneapolis	Lufkin, H. M.	St. Paul	Meckstroth, C. W.	Brandon
Koller, L. R.	Minneapolis	Lum, C. E.	Duluth	Meeker, W. R.	Rochester
Kolset, Carl D.	Benson	Lundgren, A. C.	Minneapolis	Meierding, Wm. A.	Springfield
Koucky, J. D.	Rochester	Lundholm, A. M.	St. Paul	Meighen, J. W.	Ulen
Kraft, Peter	Duluth	Lyday, R. O.	Rochester	Mellicke, W. A.	Nicollet
Kremer, Walter J.	Minneapolis	Lynam, Frank	Duluth	Melby, Benedik	Blooming Prairie
Kretschmar, Karl E.	Minneapolis	Lynch, M. J.	Minneapolis	Melson, Oliver C.	Rochester
Kriedt, Daniel	Minneapolis	Lyng, John	Minneapolis	Melzer, G. R.	Lyle
Kucera, Wm. J.	Minneapolis	Lynn, J. F.	Waseca	Mentzer, S. H.	Rochester
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Kusske, A. L.	Minneapolis	Lysne, Henry	Minneapolis	Merrill, J. E.	Amboy
Kuth, J. R.	Duluth	McBroom, D. E.	Faribault	Merrill, U. H.	Rochester
Kvitrud, G.	St. Paul	McCann, D. F.	Bemidji	Merriman, L. L.	Duluth
Laird, A. T.	Nopeming	McCann, G. E.	Onamia	Mesker, G. H.	Olivia
Lajole, John M.	Minneapolis	McCarthy, Donald	Minneapolis	Metcalf, F. W.	Fulda
Lampson, H. L.	Duluth	McCarthy, W. J.	Madelia	Meyer, A. A.	Melrose
Landeen, F. G.	Stillwater	McCarthy, W. R.	St. Paul	Meyer, E. L.	Minneapolis
Landenberger, John	New Prague	McCartney, James L.	Minneapolis	Meyer, P. S.	Belleplaine
Lane, Laura A.	Minneapolis	McCarthy, P. D.	Babitt	Meyerding, E. A.	St. Paul
Laney, R. L.	Puposky	McClanahan, J. H.	White Bear	Meyerding, H. W.	Rochester
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Langhoff, A. H.	Glencoe	McCloud, C. N.	St. Paul	Michelson, H. E.	Minneapolis
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La Pierre, C. A.	Minneapolis	McCoy, J. E.	Ivanhoe	Miller, V. I.	Mankato
Larsen, C. L.	St. Paul	McCoy, Mary	Duluth	Miller, W. A.	New York Mills
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Larson, E. E.	Rochester	McCuen, J. A.	Duluth	Mills, J. W.	Winnebago City
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Latchford, J. K.	Rochester	McDermott, T. E.	Minneapolis	Mingo, F. E.	Rugo
Laurent, A. A.	Minneapolis	McDonald, A. L.	Duluth	Mintener, J. W.	Minneapolis
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Lebowski, J. A.	Minneapolis	McGiffert, E. N.	Duluth	Mogilner, S. N.	St. Paul
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 Moren, E. Minneapolis
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 Morris, E. H. Austin
 Morris, F. J. Prior Lake
 Morris, R. Edwin St. Paul
 Morrison, A. W. Minneapolis
 Morrissey, F. B. St. Paul
 Morse, H. D. Rochester
 Morse, John Minneapolis
 Morse, M. P. Le Roy
 Morse, Russell W. St. Paul
 Morse, W. E. H. Morristown
 Morsman, L. H. Hibbing
 Morss, C. R. Zumbrota
 Mortenson, N. G. St. Paul
 Morton, H. McL. Minneapolis
 Moses, Joseph, Jr. . . . Northfield
 Moss, Myer N. St. Paul
 Moynihan, A. F. Sauk Center
 Moynihan, T. J. St. Paul
 Muhme, N. B. Rochester
 Murphy, A. B. Rochester
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 Murray, W. R. Minneapolis
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 Nesbit, Harold T. . . . Rochester
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 New, G. B. Rochester
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 Nicholson, J. Brainerd
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 Nippert, L. A. Minneapolis
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 Nordin, G. T. Minneapolis
 Nordland, Martin Minneapolis
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 Norrgard, H. T. Milaca
 Norris, Edgar H. St. Paul
 Norris, G. H. Annandale
 Novak, E. E. New Prague
 Nusbaum, D. H. Storm Lake, Ia.
 Nye, Katherine St. Paul
 Nye, Lillian L. St. Paul
 O'Brien, H. J. St. Paul
 O'Connor, D. C. Eden Valley
 O'Connor, J. P. St. Paul
 O'Connor, J. V. St. Paul
 O'Connor, Patrick H. . . . Amboy
 O'Donnell, D. M. Ortonville
 O'Donnell, J. E. Minneapolis
 O'Hara, J. J. Janesville
 O'Leary, P. A. Rochester
 Oberg, C. M. Minneapolis
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 Odland, Henry Minneapolis
 Oerting, Harry St. Paul
 Offutt, Susan R. Rochester
 Ogden, Warner St. Paul
 Ohage, Justus St. Paul
 Ohage, Justus, Jr. . . . St. Paul
 Ohlinger, L. R. Rochester
 Ohnstad, J. McIntosh
 Oliver, C. L. Graceville
 Olson, Albert E. Duluth
 Olson, Chas. A. St. Paul
 Olson, F. A. Minneapolis

Olson, G. M. Minneapolis
 Olson, Olaf A. Minneapolis
 Olson, O. S. Duluth
 Olson, R. G. Minneapolis
 Olson, W. P. Gaylord
 Onsgard, C. K. Halstad
 Onsgrd, L. K. Houston
 Opheim, O. V. Starbuck
 Oppegard, M. O. Crookston
 Oredson, O. A. Duluth
 Osborn, Lida Mankota
 Ostergren, E. W. . . . St. Paul
 Otto, H. C. Frazer
 Owre, Oscar Minneapolis
 Pake, S. G. Duluth
 Palmer, C. F. Albert Lea
 Palmer, W. L. Albert Lea
 Paradine, J. Duluth
 Pardee, K. Moorhead
 Pare, L. T. Duluth
 Parker, B. R. Rochester
 Parker, H. L. Rochester
 Parker, J. William . . . Rochester
 Parker, O. W. Ely
 Parks, A. H. Minneapolis
 Parrott, B. W. Long Prairie
 Parson, L. R. Elbow Lake
 Passer, A. A. Olivia
 Patterson, C. H. Barnesville
 Patterson, W. E. Minneapolis
 Patterson, W. E. Westbrook
 Patterson, W. L. . . . Fergus Falls
 Paulsen, E. L. Minneapolis
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 Paulson, G. A. Duluth
 Paulson, T. S. Fergus Falls
 Payette, C. H. Duluth
 Pearce, N. O. Minneapolis
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 Pederson, A. H. St. Paul
 Pederson, Harold . . . Minneapolis
 Pederson, O. J. Hanska
 Pederson, R. M. Minneapolis
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 Penhall, F. W. Morton
 Pennie, D. F. Duluth
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 Perry, C. G. St. Paul
 Perry, R. St. J. Minneapolis
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 Peterman, M. G. Rochester
 Peters, R. M. Minneapolis
 Petersen, J. R. Minneapolis
 Peterson, A. A. Mora
 Peterson, Alfred Dassel
 Peterson, Christian . . . Owatonna
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ORIGINAL ARTICLES

PROBLEMS IN RELATION TO THE HARD OF HEARING*

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Under the above rather broad title it is our purpose to present a few facts in regard to the needs of the deafened as they concern the physician, particularly the general practitioner with his broad interest in human welfare.

A conservative estimate, based upon various sources, including statistics furnished by medical examinations in our public schools and the examinations of drafted men, discloses the fact that we have in the United States upwards of three million individuals of all ages whose hearing acuity has been so reduced as to prove a handicap in their educational progress, in their economic efficiency and in their capacity to enjoy normal social contact with their fellows. This estimate seems not unreasonable when one reads in the advertising pages of our popular journals the statement of a single manufacturer of an electrical apparatus to aid the deafened, that he has already sold more than 400,000 of his appliances; and he is but one of several makers of well known forms of ear phones, which only persons with a well advanced impairment can advantageously use.

It is conceded that by far the greater number of cases of deafness are preventable. Thus the situation, involving so large a number whose condition is practically as unfortunate as that of the blind, challenges the skill, active interest and intelligent efforts, not only of the otologist, but of the physician, the educator and the social service worker.

The problems of the deafened (in distinction

from deaf mutes or the congenitally deaf) may be grouped as: (1) those pertaining to the prophylaxis and treatment of all diseases which may result in impaired hearing; (2) those relating to the education and rehabilitation of the deafened; (3) those pertaining to the economic and social welfare of the hard of hearing.

Prophylaxis and Treatment.—After attempting to teach otology to undergraduate medical students for more than a decade, it is the writer's opinion that the fundamental need in the prevention of acquired deafness lies in a more thorough training of the medical student in this branch of medicine, whereby he would be better equipped to recognize and successfully treat those diseases which lead to impaired hearing. This demands that more time be devoted to this subject in our medical schools than is now accorded it. Properly equipped so as to be sufficiently skilled and interested in diseases of the ear, the general practitioner would be able to render as good service in this field as he gives in general surgery or internal medicine. That he is not adequately equipped is attested by his evident lack of enthusiastic interest in otology and by the impressive number of our failures to prevent avoidable cases of defective hearing. It should never be forgotten that the majority of patients are not in the habit of consulting a specially trained otologist for the seeming insignificant maladies which so often lead in time to irreparable loss of hearing. In this matter, however, the public should be educated by the family physician to neglect no ear symptom or any diseased condition of the upper respiratory tract which might affect the hearing.

Other important points in the prevention of deafness are: (1) the regular routine examination at frequent intervals of all individuals as to the acuity of their hearing and (2) the earliest possible removal of all discoverable pathological factors which might cause ear disease. Children of school age in our cities, to a large extent, receive this attention, but the benefits of such examinations

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and treatments must be extended to individuals of all ages and in all communities.

The problem of the proper treatment of one who has become materially deafened calls for a considerable degree of skill, judgment, tactfulness and consideration. Whatever local treatment is contemplated in chronic cases should always be based upon the results of a painstaking otological examination. Any physician who arbitrarily advises a patient who is hard of hearing that nothing can be done to help his condition, without having himself made a careful otological examination or having had such examination made by a competent otologist, commits an act of gross unfairness to the afflicted party and discredits the ideals and skill of other members of his chosen profession. Yet, today we see among the hard of hearing numerous examples of almost criminal neglect on the part of parents, of the patients themselves or of their previous medical advisors. This neglect is rarely intentional, but is rather the result of ignorance; yet the consequences to the patient are none the less disastrous. It must be conceded that local treatment in these cases, except for occasional short periods when especially indicated by varying conditions, is often useless. Far more important is the removal of all causes which may be still operative to produce further impairment of hearing acuity. Such causes may be found in disturbances of function of the upper respiratory tract or in focal infections, even as remote as in the intestinal tract. For the patient's best interest it is of the greatest importance that everything be done to preserve as long as possible what remnant of hearing he has left, for even a slight remnant is useful in keeping up communication with the outer world. Since many cases of impaired hearing in adult life are the result of pathological conditions in remote parts of the body, the skill of the internist or the surgeon may be required. Often noticeable improvement in acuity of hearing follows the application of measures to improve the general health.

Our most helpful resource in solving the problems of those who are already materially deafened is found in lip reading. Too much cannot be said in favor of this boon to the hard of hearing. As the blind substitute hearing and the sense of touch for sight, so, even with a greater degree of success, the deafened, with a mind trained to alertness and application, can substitute the sight for hearing. The accomplishments of the skilled lip reader

in the understanding of spoken language are truly marvelous. It is very important that all those whose impairment of hearing requires any considerable effort to understand the conversational voice should be urged to begin lip reading at once in order to compensate for the diminishing acuity.

While lip reading can not be acquired with equal proficiency by all, nor does it prove always infallible, and can not be depended upon in all business relations, it does more than any other measure to mitigate the sense of isolation of the deafened and improve his outlook upon life. Every one with good vision can become more or less proficient in the art, good results being obtained by many in three or four months of close application. Others require more time. The highest degree of skill can only be attained by years of training.

Many in the group of hard of hearing, but by no means all deafened persons, derive much help from the use of one or another of the various electrical devices for the hard of hearing. Through the application of some of the newer principles of amplification employed in the radio-phone this form of apparatus promises an increasingly wider range of application among the deafened. All apparatus of this sort should be purchased only after trial.

Education and Vocational Training.—The physician's responsibility to the deafened does not end with giving him the best medical care and advice, referring him to a teacher of lip reading and possibly suggesting that he try an electric ear phone. Because of his better understanding of the deafened patient's peculiar needs, from infancy to old age, the physician is to be regarded as the special friend and adviser of the hard of hearing in regard to his educational and vocational requirements. He should, therefore, keep himself informed as to the various agencies provided to meet the needs of this group.

In the majority of our states generous provision is made for the education and vocational training of the hard of hearing of school age. Minnesota ranks well in this regard and we have in our state a school for the deaf, with its 270 pupils, an excellent institution, which has done wonderful service under the fine leadership of the late Dr. Tate.

All teachers of the deaf emphasize the great importance of beginning the specialized training of the young child at the earliest possible age. The

ideal condition would make the mother the special teacher, and this can be accomplished in a measure if the mother is intelligent and is informed of her great responsibility, and can be given the right supervision. The family physician can be of the greatest help in putting her in touch with the proper agencies and literature to direct her in the care of her deafened child.

Children under 8 years of age, unfortunately, are not admitted to our state school for the deaf. In consequence, several of the most valuable years for the acquisition of knowledge and flexibility of speech are lost.

Recently enacted laws make it now possible for any school district, in which there are a minimum of five hard of hearing pupils between the ages of 4 and 21 years, to organize a day school for the deaf, employing a specially trained teacher. For each child state aid in the sum of \$250.00 is granted, and a further sum of \$100.00 may be allowed for transportation. Thus, the benefits of special instruction may be extended to the residents of smaller communities in their own homes, beginning at the age of 4 years, when the greatest amount of good can be done them. Day schools for the deaf in Minnesota already exist in Minneapolis, St. Paul, Duluth and Rochester, and will doubtless soon be formed in other places, as the possibilities of the work become better known.

Social and Economic Problems.—The social and economic problems of the hard of hearing are very important and real to the afflicted. They grow out of the peculiar psychology of this class and can be best met by those who understand the viewpoint of the deafened. Here again the physician, or one who has made a special study of their needs, is best able to alleviate the condition of this large group. This includes the many who have become deafened during adult life. This class calls for special consideration, for their distress is often very acute. Unaided, the recently deafened man faces a calamity of large proportions. In the words of Dr. Wendell C. Phillips, "to him must be imparted courage and inspiration to enable him to throw off the depression, dependence, diffidence, lack of self-reliance and self-pity, which are the outgrowth of his condition. He must be shown how he can overcome his defect by substitution, how he can make the very most of what he has left, how he can adapt himself by rehabilitation

to a new life made not only tolerable but happy through occupation and usefulness."

These problems of the deafened in many larger communities are being best met by special organizations composed largely of the hard of hearing, whose object it is to do social service work among their own kind. During the past few years many such organizations have been formed. They have recently united in the American Federation of Organizations for the Hard of Hearing. The features of such local organizations embrace some of the facilities of a club, furnishing primarily a home for their chief activities. An ideal organization of this kind consists of three types of individuals, the otologist and physician, the social worker and those with acquired deafness. "These all unite in a combined effort to arouse the deafened man or woman out of despair and make them over into alert, happy, hopeful and self-supporting citizens." —Phillips.

Their activities include classes in lip reading, the maintenance of an employment bureau, various social and study clubs to entertain their members and to give them opportunity for self-expression.

The employment bureau is a thoroughly appreciated feature, bringing together those capable of rendering superior service and employers who are in real need of the dependable help which the deafened man or woman can render, often more efficiently than those with normal hearing. It is surprising how many fields of work are suited to the capabilities of the individual who is hard of hearing, especially if he is trained or experienced and has learned lip reading. In the work of the employment bureau for the deafened, it is only a question of fitting the right person into the right place.

Further activities of these local organizations include social clubs, lecture courses, radio clubs, entertainments and other opportunities for culture and the formation of helpful, sympathetic friendships—all calculated to meet the higher needs of the individual. Attempt is also made to do as much welfare work as possible among those similarly afflicted, including an intelligent propaganda for the prevention of deafness. No class is more keenly interested in this phase of the work than the deafened themselves, who are most eager that others be spared the same affliction as their own. Again quoting Dr. Wendell C. Phillips, "All these activities react most favorably upon the individual

and transform him into a helpful, self-respecting, inspiring member of his community."

In our larger cities with large membership, including often persons of means and leisure, a more pretentious program is consistently followed. In Chicago a careful survey of the condition of children in a typical public school, as regards the hearing, was undertaken under the auspices of the local league for the hard of hearing. This has yielded valuable information. In another city a free ear clinic in the public schools was established. In some communities a committee on legislation regarding the deafened is maintained.

Already twenty-four such organizations have been formed in the United States. Of these Minnesota boasts one, the Minneapolis League for the Hard of Hearing. Although less than two years old, it has a membership of 150, maintains an attractive club room with a good library, carries on numerous helpful activities and, under the guidance of an executive secretary and generously supported by an enthusiastic group of helpful citizens, is already serving a useful mission.

The national organization, the American Federation of Organizations for the Hard of Hearing, which holds its fourth annual meeting in Washington, D. C., in June, 1924, is at all times ready to help in any legitimate way the individual deafened person, the parents of deafened children, the physician or any one interested in the welfare of the hard of hearing. It generously assists groups to form local organizations, acting most efficiently in an advisory capacity in this work. It has adopted as its official organ the *Volta Review*, which enjoys a wide circulation among the deafened and those interested in the problems of the deafened.

From the point of view of the otologist and physician, the formation of local organizations with the purposes outlined is desirable in all communities of sufficient size to justify the undertaking. Such an organization takes up the work for those with impaired hearing where the purely technical work of the otologist and the physician ends. His recognition of the service of such organizations is best shown by his personal participation in these activities and by acquainting his hard of hearing patients with the advantages of affiliation with a co-operative association of this kind. By lending his personal encouragement and active support he will aid in solving many of the problems of the hard of hearing more effectively than by working alone.

DISCUSSION

DR. CARL L. LARSEN, St. Paul: Dr. Newhart has brought to your attention a very important and a much neglected subject. The larger cities have for many years given this subject considerable thought and attention but unfortunately the smaller cities and particularly the rural communities have shamefully neglected this form of modern day education.

Chicago with seventeen thousand totally deaf people and twice that many partially deaf, is doing a wonderful work not only in private but in public schools.

Dr. Meyerding, who is very much interested and who has charge of this form of education in St. Paul, informs me that he has three teachers devoting their time to lip reading or oral education. There are at present twenty-two students, fourteen of whom are totally deaf and eight partially so.

If the medical profession and the public were aware of the splendid opportunities afforded these unfortunate people, thousands would be saved from a life of uselessness and misery and made happy, useful and helpful citizens.

DR. THOS B. HARTZELL, Minneapolis: This morning I spent an hour reading the conclusions of a committee which had investigated the feeling of the laity among seven thousand people toward the medical profession. In that seven thousand eight hundred I believe there were nearly seven thousand who said untrue, critical and unkind things about the medical profession; and the conclusions reached by the persons who gathered this information was that the medical profession does not instruct the laity as much as they should, that the wrong system of ethics which is maintained by the medical profession precludes the physician's telling those who most need him what he can do for them. If there is any one thing in the gospel of healing that is overlooked, it is this matter of deafness. The number of people who are suffering from loss of hearing who should be benefited is very great; and only just now and then do we find anyone who knows anything about facilities for correcting the difficulty.

It does seem to me, as a member of the medical profession, yet still standing on the sidelines, that we owe it to ourselves and to each other to take some more comprehensive method of bringing to the knowledge of the people the real truth about the things that can be done for the individual and are not being done because of the extreme delicacy that the medical man who is honest and upright and clean thinking conceals his light under a bushel.

I know in my own experience through the partial loss of hearing on one side and regaining it by a definite operative interference, how great the comfort has been. I feel rather deeply on this subject, and that is why I am taking your time to applaud this paper and to commend to you the thought that we are not doing enough to protect our national honor in teaching what we well might teach to the public who greatly needs it.

DR. HORACE NEWHART, Minneapolis (closing): Since there are other papers, and the hour is already late, I will not take any more time, except to thank those who have so generously discussed my paper.

THE THERAPEUTIC USE OF GERMANIUM DIOXID IN SECONDARY ANEMIA*

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TECHNIC

In the early part of our work a 0.2 per cent acid aqueous solution was given orally and hypodermically. Later the 0.4 per cent alkaline solution was used, thus securing the anion form of the germanium, which was thought to be more effective.² In preparation of this, 500 mg. of the element was dissolved in 125 c.c. of sterile, distilled water, in a sterile flask, and N/10 sodium hydroxid was added to aid in dissolving. This was then titrated back with N/10 hydrochloric acid to a hydrogen ion concentration of 7.6. From 3 to 5 c.c. of this solution, containing from 12 to 20 mg. of the germanium, was given hypodermically every one to three days. When the solution was given by mouth, from 10 to 200 mg. was given at a dose. With the exception of three cases mentioned later, the blood counts were "checked" at least twice. The hemoglobin determinations were made by the Dare and Palmer-Haldane methods, the standard of the latter being verified at frequent intervals by the oxygen capacity method of Van Slyke. Owing to the inadvisability of performing venipuncture unnecessarily, the Palmer-Haldane hemoglobin readings were dispensed with as often as was practicable.

RESULTS

Of the nineteen cases observed, a marked effect following the administration of germanium dioxid was noted in only two—one case of chronic nephritis (Case A401495), and one of chronic infectious arthritis (Case A400821). In both of these there was a rise of from 800,000 to 900,000 erythrocytes in the first twenty-four hours. These results we are unable to explain, as such a rise was not encountered later in similar cases, even with much larger doses. In these cases, the first to be observed, the erythrocyte counts were not made in duplicate as in the later cases. Case A422438, that of a woman with a bleeding duodenal ulcer and possible chlorosis, shows the most, and practically only, rise in hemoglobin. This we cannot ascribe to the germanium alone, as the patient had 45 grains of Bland's pills a day for three weeks. Furthermore, there were no symptoms of hemorrhage from the ulcer during her stay in the hospital, although she had noticed blood in the stools several times shortly before her admission. The ulcer was later cauterized, and gastro-enterostomy performed.

Germanium dioxid as a therapeutic agent was first brought before the medical profession by Hammett, Nowrey and Müller through their work at the Wistar Institute.^{**} Their investigations on albino rats revealed a marked rise in the number of erythrocytes following the administration of the germanium. It was also shown that "in the bone-marrow of rats which had received the germanium there was evidence of marked stimulation in formation of nucleated erythrocytes, in that many more of these cells were found here than in the marrow sections of the controls." On this basis they maintained that "the source of the erythrocythemia produced was the increased production of red cell precursors by the bone-marrow stimulated to increased activity."⁴ They showed that relatively large doses, 586 mg. for each kilogram of body weight, cause toxic symptoms, from overstimulation of the blood-forming organs, and that the drug does not accumulate, but is eliminated rapidly through the kidneys and alimentary tract.

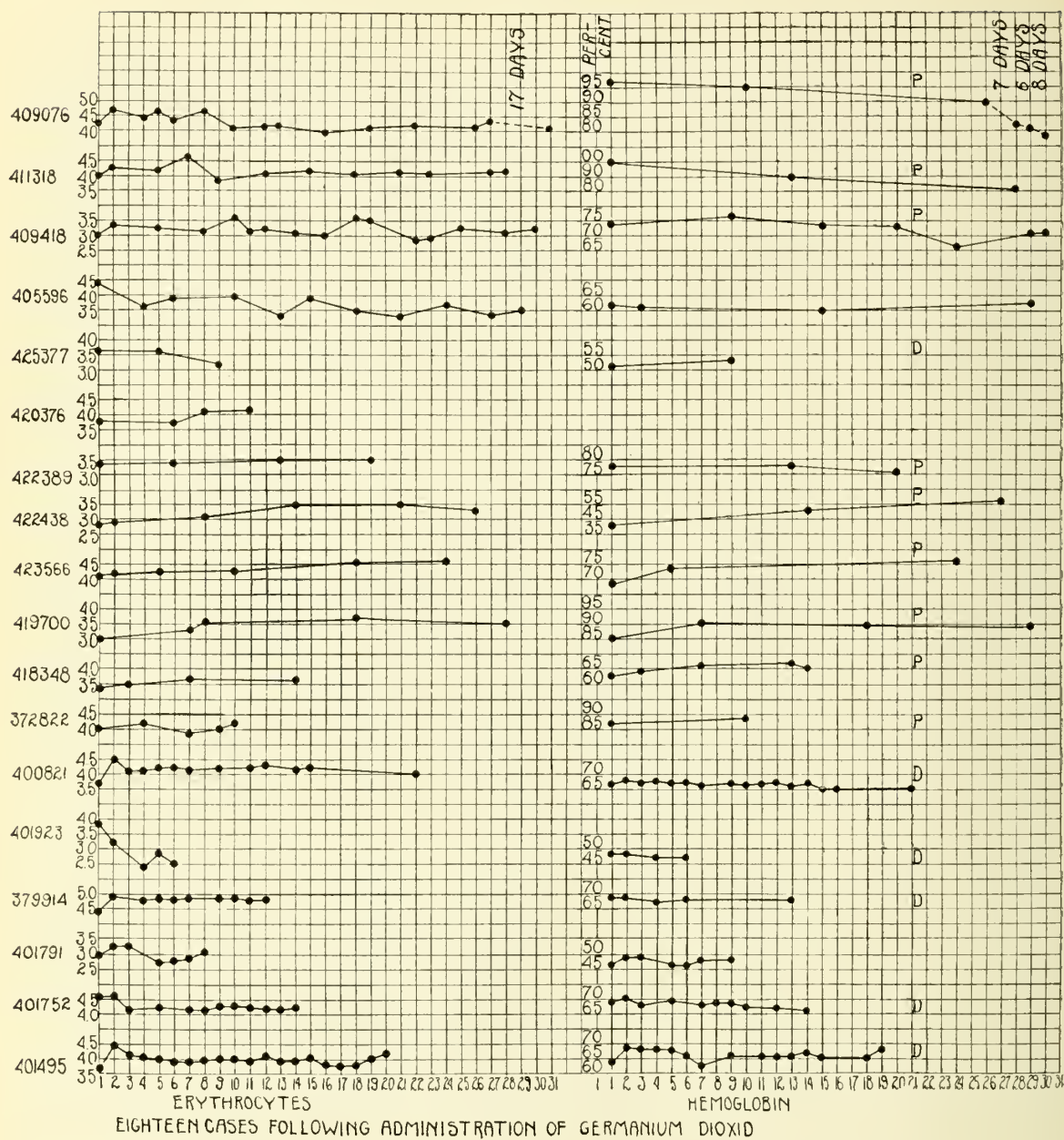
Müller and Iszard believe that germanium dioxid has a decided erythropoietic effect in the guinea pig, rabbit, dog, and man, one case being reported in which the erythrocyte count was normal.

Kast, Croll and Schmitz reported sixteen cases, in some of which the germanium was found to have a distinct erythropoietic action. They also reported that there was no effect on the kidneys, as determined by urinalysis and blood chemistry. Other writers have held that, in the treatment of secondary anemias, "germanium dioxid certainly cannot be displaced."⁶

Our investigation was begun in August, 1922, and has proceeded continually since that time. Nineteen patients have been treated for varying periods of time, most of them for the anemia of chronic nephritis, or of chronic infectious arthritis. A few cases were studied in which the anemia was very mild.

*From the Division of Medicine, Mayo Clinic.

**For our supply of germanium dioxid and for splendid co-operation in our investigation, we are greatly indebted to Dr. Hammett and his associates.



If, as it has been shown by Hammett, Nowrey and Müller, the erythropoietic action of germanium is due to the stimulating effect on the bone-marrow, it is really not surprising that no marked results were obtained in the cases of chronic nephritis. For, as shown by Brown and Roth, the anemia in such a condition is owing not only to involvement of the kidneys, but to actual disease of the bone-marrow itself, involving the function of hemapoiesis. The possibility that slight, if any, improvement can be expected in cases in which the bone-marrow is diseased, was also recognized by Hammett.

CONCLUSION

Germanium dioxid in either acid or alkaline solution, in cation or anion form, given hypodermically in doses of from 12 to 20 mg., or by mouth in doses of from 10 to 100 mg., every one to four days, over periods ranging from one to five weeks, produced practically no increase in the number of erythrocytes, nor any appreciable rise in the hemoglobin content of the blood, in our series of nineteen cases of anemia associated with chronic infectious arthritis, chronic glomerulonephritis, and chronic sepsis (Tables 1 to 11).

TABLE 1. RESULTS OF TREATMENT WITH GERMANIUM DIOXID

Case A401495. Chronic nephritis: uremia

Date	GeO ₂ , mg. by mouth	Erythro- cytes, millions	Hemoglobin (Dare) per cent
8-27-22.....	10	3.72	64
8-28-22.....	..	4.58	69
8-29-22.....	10	4.24	68
8-30-22.....	..	4.18	68
8-31-22.....	10	4.08	67
9- 1-22.....	..	3.96	66
9- 2-22.....	10	3.85	62
9- 4-22.....	..	3.96	66
9- 6-22.....	10	3.96	66
9- 7-22.....	..	4.08	66
9- 8-22.....	20	3.94	66
9- 9-22.....	30	3.92	66
9-10-22.....	40	4.10	67
9-11-22.....	..	3.76	65
9-13-22.....	50	3.68	65
9-14-22.....	..	3.60	65
9-15-22.....	..	4.46	68

Case A401752. Fever (unknown etiology)

Date	GeO ₂ , mg. by mouth	Erythro- cytes, millions	Hemoglobin (Dare) per cent
8-31-22.....	10	4.56	69
9- 1-22.....	..	4.64	70
9- 2-22.....	10	4.30	68
9- 4-22.....	10	4.52	69
9- 6-22.....	..	4.40	68
9- 7-22.....	20	4.36	68
9- 8-22.....	30	4.66	68
9- 9-22.....	40	4.60	67
9-11-22.....	..	4.48	66
9-12-22.....	50	4.28	65
9-13-22.....	..	4.36	66

TABLE 2. RESULTS OF TREATMENT WITH GERMANIUM DIOXID

Case A401791. Anorexia nervosa

Date	GeO ₂ , mg. by mouth	Erythro- cytes, millions	Hemo- —Hemoglobin— (Dare) (Palmer) per cent per cent
9- 7-22.....	10	2.94	46.3 47
9- 8-22.....	20	3.42	49 49
9- 9-22.....	30	3.38	49 ..
9-11-22.....	40	2.66	46 ..
9-12-22.....	50	2.76	46 ..
9-13-22.....	..	2.88	48 ..
9-15-22.....	..	3.10	48 ..

Case A379914. Arthritis

Date	GeO ₂ , mg. by mouth	Erythro- cytes, millions	Hemo- —Hemoglobin— (Dare) (Palmer) per cent per cent
9- 1-22.....	10	4.40	69 ..
9- 2-22.....	..	4.96	69 ..
9- 4-22.....	10	4.76	67 ..
9- 6-22.....	..	4.78	68 ..
9- 7-22.....	10	4.72	68 ..
9- 8-22.....	20	4.80	68 ..
9- 9-22.....	30	4.80	68 ..
9-10-22.....	..	4.86	68 ..

9-11-22.....	40	4.86	68 ..
9-12-22.....	..	4.92	68 ..
9-13-22.....	..	4.76	68 ..

Case A401923. Chronic nephritis with uremia

Date	GeO ₂ , mg. by mouth	Erythro- cytes, millions	Hemoglobin (Dare) per cent
9- 8-22.....	20	3.72	48 50.7
9- 9-22.....	..	3.36	48 51.5
9-10-22.....	30	...	.. ..
9-11-22.....	40	2.46	47 ..
9-12-22.....	50	2.80	47 ..
9-13-22.....	..	2.50	47 50

TABLE 3. RESULTS OF TREATMENT WITH GERMANIUM DIOXID

Case A400821. Chronic infectious arthritis

Date	GeO ₂ , mg. by mouth	Erythro- cytes, millions	Hemoglobin (Dare) per cent
8-27-22.....	10	3.66	66
8-28-22.....	..	4.54	68
8-29-22.....	10	4.20	67
8-30-22.....	..	4.22	68
8-31-22.....	10	4.28	67
9- 1-22.....	..	4.32	67
9- 2-22.....	10	4.24	66
9- 4-22.....	..	4.36	67
9- 6-22.....	20	4.30	66
9- 7-22.....	..	4.62	67
9- 8-22.....	20	4.50	67
9- 9-22.....	30	4.40	66
9-11-22.....	40	4.50	67
9-12-22.....	50	4.48	65
9-13-22.....	..	4.36	65
9-18-22.....	..	4.04	65

TABLE 4. RESULTS OF TREATMENT WITH GERMANIUM DIOXID

Case A372822. Chronic glomerulonephritis

Date	GeO ₂ , mg. hypo- dermically	Erythro- cytes, millions	Hemoglobin (Palmer) per cent
11-29-22.....	12	3.98	86.3
12- 1-22.....	12	4.34	..
12- 4-22.....	12	3.88	..
12- 5-22.....	12	...	..
12- 6-22.....	12	4.02	..
12- 7-22.....	12	4.40	88

Case A418348. Chronic infectious arthritis: splenomegaly

Date	GeO ₂ , mg. hypo- dermically	Erythro- cytes, millions	Hemoglobin (Palmer) per cent
2-28-23.....	12	3.40	63
3- 1-23.....	12	...	..
3- 2-23.....	12	3.48	64.5
3- 4-23.....	12	...	..
3- 6-23.....	12	3.68	65.7
3- 9-23.....	12	...	..
3-12-23.....	12	3.68	66
3-13-23.....	..	3.60	65

TABLE 5. RESULTS OF TREATMENT WITH GERMANIUM DIOXID

Case A419700. Chronic infectious arthritis

Date	GeO ₂ , mg. hypo- dermically	Erythro- cytes, millions	Hemoglobin (Palmer) per cent
4- 7-23.....	12	3.08	85
4- 9-23.....	12	...	..

4-13-23.....	40*	3.36	91
4-14-23.....	..	3.56	..
4-16-23.....	12	...	..
4-19-23.....	80*	...	..
4-21-23.....	16	...	..
4-24-23.....	16	3.64	..
4-27-23.....	16	...	..
5- 1-23.....	16	...	..
5- 5-23.....	..	3.52	89

Case A423566. Chronic infectious arthritis

5-10-23.....	20	4.12	68.8
5-11-23.....	..	4.28	..
5-14-23.....	20	4.28	73
5-16-23.....	20	...	..
5-17-23.....	20	...	..
5-19-23.....	20	4.32	..
5-23-23.....	20	...	..
5-27-23.....	20	4.54	..
6- 1-23.....	..	4.54	76

* By mouth.

TABLE 6. RESULTS OF TREATMENT WITH GERMANIUM DIOXID

Case A422438. Duodenal ulcer: chlorosis? nephritis?

Date	GeO ₂ , mg. hypo- dermically	Erythro- cytes, millions	Hemoglobin (Palmer) per cent
4-14-23.....	12	2.88	33
4-15-23.....	..	2.93	..
4-19-23.....	20	...	..
4-20-23.....	80*	...	..
4-21-23.....	80*	...	..
4-24-23.....	16	...	..
4-27-23.....	..	3.52	43
5- 1-23.....	20	...	..
5- 4-23.....	..	3.52	..
5- 9-23.....	..	3.52	56

Case A422389. Chronic infectious arthritis

4-14-23.....	12	3.40	78
4-19-23.....	16	3.44	..
4-21-23.....	16	...	..
4-26-23.....	..	3.52	78
4-28-23.....	20	...	..
5- 1-23.....	16	...	..
5- 2-23.....	..	3.52	76

* By mouth.

TABLE 7. RESULTS OF TREATMENT WITH GERMANIUM DIOXID

Case A420376. Chronic infectious arthritis

Date	GeO ₂ , mg. hypo- dermically	Erythro- cytes, millions	—Hemoglobin— Dare Palmer per cent per cent	
5-16-23.....	20	4.46	72	..
5-17-23.....	20	...	..	..
5-19-23.....	20	...	..	..
5-21-23.....	20	3.76	..	94
5-23-23.....	20	4.06	70	..
5-26-23.....	..	4.10	..	94
6- 3-23.....	20	...	..	..
6- 4-23.....	..	4.46	72	..

Case A425377. Chronic infectious arthritis

5-15-23.....	..	3.67	52	..
5-19-23.....	20	3.64	..	69.4
5-21-23.....	20	...	..	..
5-23-23.....	..	3.36	53	..
5-26-23.....	20	...	..	..
6- 1-23.....	20	...	..	..
6- 5-23.....	20	...	..	..
6- 8-23.....	20	...	..	..
6-11-23.....	20	...	..	..
6-12-23.....	20	...	..	..
6-13-23.....	20	3.62	53	..
6-14-23.....	20	...	..	..
6-15-23.....	20	...	..	..
6-16-23.....	20	3.96	54	..

Case A424174. Subacute glomerulonephritis

6-10-23.....	20	2.16	40.8	..
6-11-23.....	20	...	..	..
6-13-23.....	20	2.28	42.6	..
6-14-23.....	20	...	..	..
6-15-23.....	20	...	..	..
6-16-23.....	20	2.28	41	..

TABLE 8. RESULTS OF TREATMENT WITH GERMANIUM DIOXID

Case A405596. Chronic infectious arthritis

Date	GeO ₂ , mg. hypo- dermically	Erythro- cytes, millions	Hemoglobin (Palmer) per cent
11-25-22.....	12	4.46	63
11-27-22.....	..	3.90	..
11-28-22.....	12	3.58	..
11-30-22.....	12	3.90	..
12- 3-22.....	12	...	..
12- 4-22.....	12	3.96	..
12- 6-22.....	12	...	..
12- 7-22.....	..	3.34	..
12- 8-22.....	12	...	61
12- 9-22.....	..	3.84	..
12-11-22.....	12	...	..
12-12-22.....	..	3.50	..
12-13-22.....	12	...	..
12-15-22.....	..	3.30	..
12-18-22.....	12	3.70	..
12-19-22.....	12	...	..
12-21-22.....	..	3.30	59
12-23-22.....	..	3.52	..

TABLE 9. RESULTS OF TREATMENT WITH GERMANIUM DIOXID

Case A409418. Chronic glomerulonephritis

Date	GeO ₂ , mg. by mouth	Erythro- cytes, millions	Hemoglobin (Palmer) per cent
11- 7-22.....	100	3.05	74
11- 8-22.....	100	3.37	..
11- 9-22.....	100	...	..
11-10-22.....	100	...	74
11-11-22.....	100	3.20	..
11-12-22.....	100	...	..
11-13-22.....	100	...	..
11-14-22.....	100	3.10	77
11-15-22.....	100	...	..
11-16-22.....	...	3.62	..

Hypodermically							
11-17-22.....	12	3.14	..	11-17-22.....	..	4.62	..
11-18-22.....	12	3.22	..	11-18-22.....	12	4.48	..
11-19-22.....	12	...	..	11-20-22.....	..	4.64	..
11-20-22.....	..	3.06	68	11-22-22.....	12	4.10	95
11-22-22.....	12	3.02	..	11-24-22.....	..	4.14	..
11-24-22.....	12	3.59	..	11-25-22.....	12	4.18	..
11-25-22.....	..	3.54	68	11-28-22.....	..	3.98	..
11-28-22.....	12	2.76	..	11-29-22.....	12	...	..
11-29-22.....	..	2.90	61.7	12- 1-22.....	..	4.19	..
12- 1-22.....	..	3.31	..	12- 3-22.....	12	...	..
12- 4-22.....	12	3.06	71	12- 4-22.....	..	4.23	..
12- 6-22.....	..	3.38	71	12- 6-22.....	12	...	..
				12- 8-22.....	12	4.10	95
				12- 9-22.....	..	4.30	..
				12-10-22.....	12	...	..
				12-12-22.....	..	4.16	..
				12-14-22.....	12	...	..
				12-15-22.....	..	4.58	83
				12-18-22.....	..	4.42	..
				12-19-22.....	12
				12-21-22.....	20	4.16	81
				12-23-22.....	..	4.04	..
				12-27-22.....	..	4.24	..
				12-29-22.....	..	4.16	79.5

* By mouth.

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TABLE 10. RESULTS OF TREATMENT WITH GERMANIUM DIOXID

Case A411318. *Psoas abscess*

Date	GeO ₂ , mg. hypo- dermically	Erythro- cytes, millions	Hemoglobin (Palmer) per cent
12- 1-22.....	12	3.98	100
12- 2-22.....	..	4.28	..
12- 3-22.....	12	...	..
12- 5-22.....	..	4.22	..
12- 6-22.....	12	...	..
12- 7-22.....	..	4.58	..
12- 9-22.....	12	3.88	..
12-12-22.....	..	4.04	90
12-13-22.....	12	...	..
12-14-22.....	12	...	..
12-15-22.....	..	4.18	..
12-16-22.....	..	4.04	..
12-19-22.....	12	...	..
12-21-22.....	12	4.26	..
12-23-22.....	12	4.22	..
12-27-22.....	..	4.22	..
12-28-22.....	12	4.30	81

TABLE 11. RESULTS OF TREATMENT WITH GERMANIUM DIOXID

Case A409076. *Pyelonephritis*

Date	GeO ₂ , mg. hypo- dermically	Erythro- cytes, millions	Hemoglobin (Palmer) per cent
11-13-22.....	100*	4.31	96.1
11-14-22.....	100*	4.66	..
11-15-22.....	12	...	..
11-16-22.....	12	4.48	..

THE RESISTANCE OF MALARIA TO QUININ

In 1917, reports began to appear that English soldiers in the tropics were being attacked by malaria that quinin would not cure. A report was published that quinin was ineffective in cases that were complicated by dysentery. An extensive study has demonstrated that quinin will cure malaria and that dysentery does not prevent the cure. In these cases the physician administered the quinin by mouth

and made sure that it was swallowed. A study of the intramuscular injection of quinin demonstrated that necrosis of the muscle always occurred and that the absorption was less satisfactory than when the drug is given by mouth. It was shown that there was a profound fall in blood pressure when quinin is introduced intravenously, and one case of death and one case of serious sepsis are reported. It was also found that quinin is too irritating to be administered by rectum.—(*Journal A. M. A., April 5, 1924, p. 1125.*)

POSTOPERATIVE MASSIVE COLLAPSE OF THE LUNGS*

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In a previous article¹ I called attention to the relative frequency of postoperative massive collapse of the lungs as a postoperative pulmonary complication, summarizing the literature and adding my own experience, in an effort to call attention to its clinical entity and distinctive symptomatology. Shortly before this, Scrimger² reported several cases, incorporating roentgenograms, which revealed strikingly the alteration in the relationship of the thoracic viscera. Unfortunately, roentgenographic studies were not made on my reported cases, but the opportunity of witnessing the clinical course of another case recently, with the associated roentgenologic data, prompted me to present the subject before you.

Historical.—W. Pasteur³ first called attention to the occurrence of massive collapse of the lungs in 1890, basing his report on an experience with post-diphtheritic paralysis of the diaphragm and other accessory respiratory muscles. This was further elaborated in two subsequent presentations^{4,5}, in which he described the macroscopic pathology, and drew attention to its occurrence postoperatively as well as post-diphtheritically, and advanced the theory of the active contraction of the part affected as the most reasonable cause.

The condition was subsequently described by Dingley and Elliot⁶, Rose-Bradford⁷, Briscoe⁸, Scrimger², and Elwyn and Girsdansky⁹.

Pathogenesis.—Through clinical and experimental investigation it has been thought that massive collapse of the lungs is due to one of two causes or both: (1) Obstruction of the bronchial tubes; (2) Immobility of the diaphragm or accessory respiratory muscles.

In 1878, Lichtheim¹⁰ produced a condition in rabbits similar to massive collapse, introducing laminaria plugs in a bronchial tube, resulting in a collapse of the lung portion tributary to the bronchus subjected to the experiment. The examination of the viscera showed the alveoli virtually closed by absorption of the air content, producing a negative

pressure and causing thereby a dislocation of the neighboring organs toward the affected area.

Its occurrence as a result of post-diphtheritic phrenic paralysis suggested to Pasteur the influence of immobility of the diaphragm and accessory respiratory muscles as a cause. He believed that the process of deflation was not due to alveolar absorption of air, but rather to the unopposed contraction of the pulmonary tissue no longer prevented by the muscular excursion of the chest on account of immobility of the chest wall.

Rose-Bradford also pointed out that the condition occurred most commonly in patients who had injuries necessitating immobilization for a period of time, such as gunshot wounds in the chest, abdomen or legs. It rarely if ever occurs in injuries about the head or arms, because of the patient's ability to be up and about. Postoperative cases requiring absolute bed rest are a fertile field for the production of this condition, as it is never found in ambulant cases, and the immobilization of the body, with the resultant immobility of the thoracic musculature, is the most potent cause.

Scrimger believed that the lesion was due to an abdominal interference with the vagus control, causing a contraction of the muscular elements of the lungs, aided by a subsequent collection of mucus in the bronchial tubes, sufficient to prevent the ingress of air, and leading to an absorption of the alveolar air contents, and eventually to collapse. This is in accord with my belief, as pointed out in my previous publication, since clinically there is sufficient proof that immobilization is a profound factor, whereas experimentally the same condition has been produced by plugging of the bronchial tube, even though the latter is not or only rarely found at post-mortem examination. As a result of abdominal trauma in laparotomy the resultant recumbent position exerts an influence in bringing about collapse of the lung, by a fixation of the diaphragm, on account of reflex inhibition and an effort on the part of Nature to splint the traumatized vicinity. The admonition to operative patients to take deep breathing exercises systematically after operation not only tends to promote aeration of the distal parts of the bronchial tree, but tends to reduce the immobility of the perithoracic musculature. In the patients seen by me it has not occurred in individuals who were exhorted to indulge in this practice. Coincident with the fixation of the diaphragm and chest muscles, mucus forms

*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, October, 1923.

in the bronchial tubes, and is not expelled, causing an obstacle to the ingress of air in the smaller bronchial tubes, leading ultimately to alveolar absorption of the air into the circulation or gradual expulsion by pulmonary contraction.

Occurrence.—As pointed out by Pasteur, massive collapse occurs more frequently than embolism, abscess or pleural effusion (either of the serous or purulent type), but is not as frequent as pneumonia, bronchitis or dry pleurisy. It was observed by him in twelve of 201 lung complications following 3,559 operations in the Middlesex Hospital between 1903 and 1910. He later observed sixteen cases in 1,930 laparotomies in the years 1911 and 1912.

The condition is by no means infrequent. Rose-Bradford has pointed out that it occurs in 5 to 10 per cent of all chest injuries incurred in military practice.

It has been noted in massive collapse that the extent and site of involvement vary considerably. In some instances there is only a partial involvement of one of the lower lobes of the lungs; in others, the condition is more extensive, involving a whole lobe, or even an entire side. It is frequently bilateral, and, if so, affects particularly the lower lobes only. Rose-Bradford has pointed out in his consideration of the subject that unilateral trauma causes collapse not only on the affected side but frequently on the contra-lateral side as well.

Physical Signs and Symptoms.—The physical signs and symptoms of massive collapse are so distinctive as to establish the condition at once as a definite clinical entity. The exciting factor in civil practice is usually trauma, accidentally incurred or otherwise, necessitating immobilization of the body, but it undoubtedly follows post-diphtheritic paralysis of the phrenic nerve not infrequently, as pointed out by previous observers. It has been known to follow all methods of anesthesia. Rose-Bradford has pointed out its common development in military practice in gunshot wounds of the chest, abdomen and lower extremities, but in civil life abdominal operations are the most frequent cause of the condition, on account of the immediate effect in producing relative immobility of the diaphragm and deficient aeration of the lungs.

The symptoms may develop within a few hours or as late as one week after the exciting trauma, but it usually develops in two or three days. It is characterized by sudden onset, a rapid course over a period of from two to five days, and resolution

which is usually, clinically, rather prompt, but pathologically and roentgenologically slow. The degree of fever is usually moderate, and not in proportion to the marked increase in the pulse rate or the respiration rate. The fever may be as high as 103 or 104 degrees, the coincidence of the inflammatory phenomenon probably influencing the height of the curve. The temperature in the cases observed by me was usually between 102 and 103. The respiration rate is undoubtedly increased by the immobility of the affected part, by accompanying pleuritis or by toxic conditions incident to an inflammatory superimposition. The pulse rate peculiarly is out of proportion to the respiratory and thermic curves, and has a tendency, with the respiratory rate, to remain relatively high even after the temperature is normal.

The physical signs are striking and characteristic. On inspecting the chest one is impressed by the diminished or absent excursion of the chest wall over the affected area. The cardiac impulse is displaced toward the affected side, and is as marked on the left-sided cases as in those occurring on the right side, the apex tilting upward and outward so that it not infrequently is felt in the axilla. In right-sided affections the impulse may be felt at the tip of the sternum or to the right of it, and by the unwary has been interpreted as a dextrocardia. Roentgenographic studies corroborate the signs elicited by inspection, and reveal the most marked retraction of the heart toward the affected area, unusual ascension of the dome of the diaphragm, and partial or total collapse of the pulmonary area. In bilateral affections the displacement of the heart is not noted, but the high position of the diaphragm and the collapse of the lungs is easily demonstrated. On palpation the intercostal spaces on the affected side are found to be narrowed, leading to a relative approximation of the ribs. The percussion note over the affected area is dull, and may approach flatness, but it is to be pointed out that in left-sided cases the lower part of the chest wall is highly resonant, due to the abnormally high level of the diaphragm, the liver interfering with this symptom on the right. On the contralateral side hyper-resonance is noted. The breath sounds and fremitus are usually increased to an enormous degree, but may be diminished or absent, according to the observation of others. The transmission of voice sounds may be so intense as to approach whispered pectoriloquy.

In the five cases observed by me, bronchophony was present in five cases, and diminution in the breath sounds or fremitus was noted in no case. The alteration in the transmission of sounds is due to relative proximity of the affected area to patent bronchial tubules.

Râles are usually absent in the early stage, but with the development of a bronchitis, pneumonia, or when resolution takes place, they become more marked, particularly in the latter stage, when the expectoration is more profuse. With resolution the heart gradually returns to its normal position, the lungs slowly expand, and the diaphragmatic dome flattens out, but this usually is a slow restoration, requiring on the average about fourteen to twenty-one days for its completion.

The extent of the symptoms depends upon the amount of lung tissue involved, and whether the condition is unilateral or bilateral. Dyspnea may be moderate or extreme, the latter being common in bilateral cases. The general impression on observing the patients is that they are not suffering from extreme discomfort. Cough is slight, as a rule, in the beginning, with scanty expectoration, but in the later stages it is accompanied by a profuse, mucopurulent sputum. The sputum is rarely, if ever, bloody—an important consideration in the differentiation between pneumonia or infarct and collapse. The conditions which must be carefully differentiated therefrom are: bronchitis, pleurisy, pneumonia, effusion, subdiaphragmatic abscess and pneumothorax.

The symptoms, however, of collapse of the lungs, are so definite that differentiation from the other conditions is easy. The development soon after operation, the absence of a bloody sputum in spite of the evident pulmonary complication, the extreme dullness and increase in breath sounds with scant expectoration, the exaggerated displacement of the heart and diaphragm, and the rapid relief from subjective symptoms in the course of two to five days, aid in the differentiation from the conditions mentioned, and the condition has but to be kept in mind to render its recognition easy.

It is not uncommon for evidences of bronchitis to develop during the period of resolution, which tends to make the condition more protracted as far as active symptoms are concerned, and pneumonia may develop in the affected area.

In view of the fact that the roentgenologic evidence is so confirmatory, and because it is so char-

acteristic of this condition, I am submitting a case report of a patient recently observed by me through the courtesy of Drs. W. R. Bagley and P. S. Rudie of Duluth.

Mrs. K. O., admitted to St. Mary's Hospital, Duluth, June 20, 1923, under the care of Dr. Bagley, who made a diagnosis of purulent salpingitis of the right Fallopian tube, and chronic salpingitis on the left side with a cystic ovary.

An operation was performed under ether anesthesia on June 21, 1923, with a low abdominal midline incision. The uterus was found in good position. The left ovary was cystic and partially removed, as well as the left tube, and the right tube and ovary were removed in their entirety.



Fig. 1. Roentgenogram of massive collapse of the lung taken the third day of illness, June 24, 1923.

The operation was uneventful and uncomplicated but for the use of a drainage tube as a safeguard. On removal it was found that the right tube was dilated and filled with a thick yellow pus. The mucosa was considerably congested and the wall thickened. The left tube on the cut surface also showed thickening of the mucous folds and a small amount of pus in the lumen.

On June 22nd (the day after the operation), the patient's temperature was elevated to 102.6 in the afternoon, after a slight rise, in the morning, to 100.6. The pulse rate was 130 to 140 early in the morning, and remained at that high point all day. The respiration rate was between 28 and 38. With slight remissions this continued for three days, until the 25th of June, when the temperature had receded to 100 degrees. The pulse rate was 110, and the respiration rate 28.

On the 26th there was a slight increase in the temperature, the pulse and respiration rate, but only of a transitory character. From this time on the patient made a

rapid and uneventful convalescence from the clinical standpoint.

The day after the initial onset (on the 23rd of June) there was noted an entire absence of right chest expansion, with dullness over the whole right lung. It was noted that the apex beat was just to the right of the sternum.

On the 24th, tubular breathing was noted throughout the right lung, and a roentgenogram showed the heart displaced almost entirely to the right side, with the margin of the heart on the left side just barely demonstrable to the left of the sternum. The dome of the diaphragm was not visible on account of the blending of the liver and consolidated lung shadows. The left chest was hyper-resonant throughout. There was no dullness to percussion over the normal heart area, the usual dullness being replaced by pulmonary resonance. The patient was coughing but slightly, and had moderate dyspnea, relieved by a reclining position in bed. At no time was blood observed in the sputum.

With the disappearance of the fever the patient's clinical symptoms improved subjectively, but repeated examinations daily showed only a very gradual improvement in the physical signs. On the 2nd of July the expansion on the right side was still diminished, but not as marked as before. On percussion the left lung was apparently normal; on the right side there was impaired resonance from the base to the level of the fourth dorsal spine. Anteriorly the impairment of resonance was slight. Tactile fremitus was increased in the right base, and some râles were audible in the affected area. The heart sounds were apparently normal, but the displacement was still extreme.

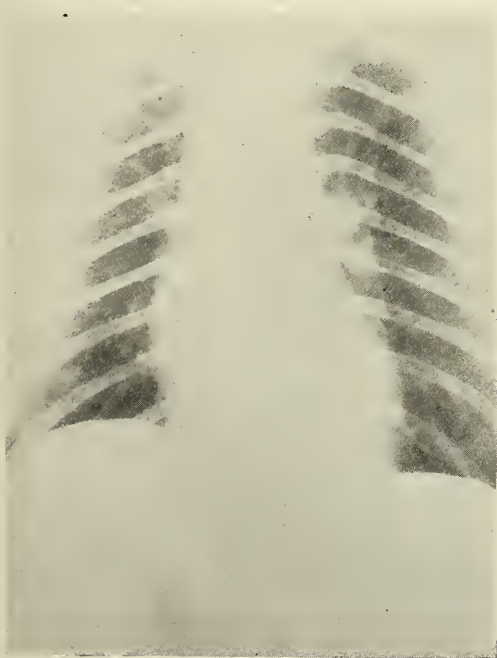


Fig. 2. Roentgenogram taken on July 20, 1923, after resolution was complete.

On July 2nd, the roentgenogram was virtually unchanged as to findings.

On the 20th of July the last roentgenogram was taken.

The lungs were found to be clear at that time, and the heart had returned to its normal position.

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DISCUSSION

DR. GEORGE D. HEAD: Mr. Chairman and gentlemen: I have made a diagnosis of massive collapse of the lung in one case, but that case unfortunately did not come to a post-mortem so that I am not sure that my diagnosis was correct. I think the article by Rose-Bradford in the *Quarterly Journal of Medicine* is very illuminating to every man who wants to post himself on this rather rare condition. It is quite possible that it is not as rare as we think and I presume a good many cases we have diagnosed as post-operative pneumonia, or at least some of them, may have been due to this condition.

I must confess that, looking at it from the standpoint of the practical clinician, the diagnosis which would come immediately to mind, where one was called upon to differentiate between this condition of massive collapse of the lung and some other post-operative intrapulmonary complicating condition, would be either a pneumonia, lobar or bronchial, or an infarct of the lung. Occasionally, of course, possibly following some operative procedure like a tonsillotomy, one might think of abscess of the lung and possibly occasionally, if it should occur in some chronic ailment, gangrene of the lung. But from the standpoint of the practical clinician it would strike me that we ought to center our attention upon the differentiation between pneumonia and massive collapse of the lung.

Fortunately for us in attempting to make that differentiation Dr. Hirschboeck has suggested that mastery inactivity is good treatment in massive collapse of the lung and there is nothing to be done but to leave the patient alone; therefore, if we do not use meddling interference, our patient will probably get well. The patient that I saw had a bilateral condition with profound cyanosis, unconsciousness, absolute loss of all respiratory sounds upon both sides of the lung, without displacement of the heart. There were no roentgenological studies made. The patient died in this condition within twenty-four hours. There was absolutely not a breath sound to be heard upon either side of the chest, and the patient was in an extreme dyspnea with cyanosis.

Where it occurs unilaterally, judging from Dr. Hirschboeck's writings and from the Bradford reports, I would say that the condition which one might confuse it with

most likely would be pneumothorax because your attention would be particularly attracted to this tremendous dislocation of the heart, and then the fixed high line position of the diaphragm would be likely to attract a man's attention as soon as he fluoroscoped the chest or had a chance to get an x-ray picture of the chest.

The pictures which Dr. Hirschboeck has shown are certainly extremely interesting and instructive. I must say that we need information and I am glad that the doctor has brought this subject before us. I would like to ask him whether or not in the cases that he has seen the leukocyte count has been of any value in differentiating between pneumonia and this condition, whether or not the differential leukocyte count has been of any value in the differentiation. As I said before, we need all the help we can get in attempting to differentiate this condition. It would strike me that from an etiological point of view we could consider it something of the same nature as the condition which we find in acute nerve paralysis such as one sees in acute gastric dilatation or in acute post-operative ileus. It must be something of that sort. It is not reasonable to think that it could be due to anything mechanical; at least the patient I saw did not give any indication of a plug in the bronchus or the branch of the bronchus.

DR. EDWARD L. TUOHY: Dr. Hirschboeck has given you about all I know concerning this clinical entity but I would like to hammer in a few points: Post-operative cases are assumed to have some inflammatory lung complications, without going over them very carefully, because it is impossible to examine people who are in distress and uncomfortable, and it is only recently that roentgen plates have come into use, to uncover these changes which can occur in the lung and not be noticed clinically. In the next place, the cases that are unilateral usually recover. We were fortunate in having an early bilateral instance which came to us, and it drew our attention very forcefully to massive collapse.

I referred this morning to having met Sir John Rose-Bradford. I discussed massive lung collapse with him per-

sonally, and he said that he had discovered four reports in the British literature in which the men discussed "Odd types of pneumonia in which the heart was pushed towards the affected side." He said, "Obviously these were not pneumonias at all but were instances of massive collapse."

In the next place, men doing post-mortems and finding considerable areas of the lung collapsed have not paid any particular attention to the etiological factors found, but have reported them as "collapse or atelectasis." Someone, I think it was Willard Bartlett, of St. Louis, made the recommendation that all post-operative cases should be urged, immediately after they come out of the anesthetic sufficiently to understand, to take long deep breaths. This I consider a very valuable safeguard against lung complications and every post-operative patient should be given that advice. In the next place the makers of adhesive plaster should not be given too much of an advantage by plastering the patient all the way from the pubis to the larynx. Give the diaphragm a chance.

DR. F. J. HIRSCHBOECK (closing): I do not believe the condition is by any means rare. It has been described a good many times in England as they are apparently on the lookout for it. From the case reports it is not uncommon. Pasteur pointed out that it was more common than abscess, embolism or pleurisy. It is nearly as common as pneumonia, but not as frequent as bronchitis. Differential diagnosis should not be difficult because the findings are pathognomonic. The displacement of the heart is an important sign. If it is on the left side it is sometimes very difficult to diagnose, because the diaphragm is extremely high. We find a good deal of resonance on the left side while the right side is not so resonant.

I am glad that Dr. Tuohy mentioned deep breathing. We usually have the patients take eight or ten deep breaths every morning and evening and they very rarely have pulmonary complications, in fact, they rarely contract pneumonia. We have made leukocyte counts and found a range from 11,000 to 26,000. Differential counts were not made.

ANTI-PNEUMOCOCCIC SERUM TYPES I, II AND III AND POLYVALENT

The New and Non-official Remedies' description of anti-pneumococcus serum stated that thus far only the Type I serum seemed to be on reasonably secure clinical ground. In consideration of favorable reports on the use of anti-pneumococcic serum which, in addition to the Type I organism, also represented Types II and III and Group IV, the Council on Pharmacy and Chemistry accepted such "polyvalent" serums. At its 1921 annual meeting, the Council considered the available evidence for the use of anti-pneumococcus serum. The conclusion was reached that there was a preponderance of evidence against the employment of a serum which represented organisms other than Type I. Accordingly, the Council has omitted from New and Non-official Remedies all anti-pneumococcic serums which represented organisms other than Type I.—(*Journal A. M. A., April 5, 1924, p. 1138.*)

PARATHYROID GLAND THERAPY

The administration of parathyroid gland has been reported of value in the treatment of a number of cases of tetany following the operative removal, or the injury of the parathyroid gland. It has prevented the attacks of tetany and of infantile tetany and seemed at times to have prolonged life, or to have saved it, while the injured glands regained their functions. It has been stated to be of value in some cases of gastric tetany, although in other cases the results were negative. Parathyroid gland has been used by some one or another at some time (and claimed to be of value) for conditions such as varicose ulcers, gastric, duodenal and cervical ulcers, tuberculosis, sinus of the hip, paralysis agitans, eclampsia, etc., but that such disorders are regularly and favorably affected by parathyroid gland administration is a conclusion unsupported by controlled clinical evidence.—(*Journal A. M. A., April 19, 1924, p. 1286.*)

CHRONIC NEPHROSIS* **

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The confusion in the terminology of renal diseases necessitates, at the very outset, an accurate definition. Nephrosis, according to Bell,¹ is a degenerative non-inflammatory process, largely confined to the tubular portion of the kidney. Space does not permit a consideration of the origin of the term "nephrosis," first applied by Müller,² nor of the extensive and rather polemic literature which has grown up about it. The acute nephroses are well recognized clinically and are one of the commonest forms of renal disease found at autopsy. They are present quite constantly, to a more or less degree, during the course of practically all the acute infections and toxemias, but are most typically seen following poisoning by the mercuric salts, chromates and tartrates. Chronic nephrosis, as either a clinical or pathological entity, is less clearly recognized. Although Volhard and Fahr³ reported thirty-three cases, Bell¹ in his extensive series has never found one clearly recognizable case. Many of Volhard and Fahr's cases were undoubtedly amyloid disease of the kidney and there is considerable doubt as to the authenticity of the remainder of their cases. Nevertheless, Von Monakow,⁴ Munk⁵ and others have reported similar pathological studies.

In this country, interest in chronic nephrosis, as a clinical entity at least, has centered largely in the contributions of Epstein⁶ of New York. On the basis of clinical, chemical, and metabolic studies, he has arrived at an original and somewhat startling conception of the disease. Chronic nephrosis, according to Epstein, unlike chronic glomerulo-nephritis, is not primarily or essentially a disease of the kidney. On the contrary chronic nephrosis is an organic, metabolic disturbance of which the massive albuminuria and edema are secondary symptoms. A review of the evidence by this author⁷ covers the subject completely.

Essentially, he describes the condition as a metabolic disturbance, the etiology of which is not definitely known, and which may be associated with hypothyroidism. The massive albuminuria is the

result of this metabolic disturbance and the loss of albumin produces a reduction of serum protein, particularly of serum albumin, with a relative increase of serum globulin. Normally the blood contains from 4 to 6 per cent serum albumin, 2 to 3 per cent serum globulin, and 6 to 8 per cent total protein. In this disease the total protein may be reduced to as low as 3 per cent, the serum albumin to as low as 1 per cent, the serum globulin remaining the same. Utilizing Starling's theory, that the osmotic pressure of the colloids of the blood tends to prevent exudation of fluid from the capillaries, it can be seen that this change in the serum protein might easily cause edema. Confirmation of this theory has recently been afforded by Kisch,⁸ and Kollert and Starlinger.⁹ Epstein also found quite constantly a marked increase in the lipid content of the blood, the cholesterol increasing from the normal of .175 to .225 per cent up to as high as 1.3 per cent. As a further contribution to the metabolic nature of the disease, Epstein and Lande¹⁰ have recorded the basal metabolic rates in a number of these cases and conclude that it is reduced. Their results, however, are not convincing. With these facts and theories in mind, Epstein has proposed that these patients be put on a high protein, fat poor diet, together with thyroid extract, and has reported a considerable success with this form of treatment. The diet consists of protein, 120 to 240 grams; fat, 20 to 40 grams; carbohydrate, 250 to 300 grams; the total calories for twenty-four hours being 1,280 to 2,500. The purpose of this diet is to replace the serum albumin which is lost through the kidneys, to reduce cholesterinemia, and to raise the metabolic rate.

That Epstein's views are not well established can easily be seen from the conflicting views in the literature which he reviews.⁷ Kahn¹¹ failed to find the changes in the serum protein which Epstein described. Geyelin,¹² Christian¹³ and others do not recognize the existence of the disease as a separate clinical entity, nor do they admit the efficacy of the treatment. On the other hand, Schwartz and Kohn¹⁴ have recently reported a group of similar cases occurring in children, in some of which the treatment was used with apparently good results. Another recent case report is that of Baker.¹⁵ Eppinger's contribution¹⁶ as to the results of thyroid therapy is of great value. In spite of these conflicting reports there is no doubt that

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**From the University Medical Division of the Minneapolis General Hospital.

Epstein has described a clinical picture which is different from the ordinary case of chronic glomerulo-nephritis. Inasmuch as the treatment is also radically different from that ordinarily used in the latter disease, it is of some importance to attempt to differentiate the two diseases.

The salient characteristics of chronic nephrosis can be summarized briefly as follows. It is a general metabolic disease, of doubtful etiology, gradual onset and protracted course. The pathology consists chiefly of a degeneration of the tubular portion of the kidney with little or no effect upon the vascular system. Clinically, the disease is characterized by massive edema, anasarca, anorexia, and general weakness. The urine is of a high specific gravity, small in quantity, contains very large amounts of albumin, casts, and rarely red blood cells. The blood shows little or no anemia, lack of any marked nitrogen retention, but a decrease in the total protein and a reversal of the normal albumin-globulin ratio. The cholesterol of the blood is usually increased and the basal metabolism is often subnormal. The prognosis has not yet been established and the treatment consists of a high protein, fat poor diet together with thyroid extract.

Inasmuch as this disease is ordinarily considered to be chronic glomerulo-nephritis, it is of importance to present the features which distinguish them. In order to present these differences graphically and briefly, we have prepared two charts. On the first are shown the essential clinical and pathological findings in the two diseases. On the second are shown the laboratory findings in the normal individual, in chronic glomerulo-nephritis, and finally in our four cases. The addition of amyloid disease does not alter the clinical picture particularly and for this reason this fourth case is reported. There are certain differences in the findings which are obvious and are due to the chronic process which causes the amyloidosis—in this case, syphilis.

In the consideration of these charts certain essential differences should be noted. The most important of these is the absence of the vascular phenomena which form such a prominent part in the clinical picture of chronic glomerulo-nephritis. In nephrosis there is no hypertension, cardiac hypertrophy, retinitis, or anemia. In addition the absence of marked nitrogen retention in the blood, and the change in the serum proteins, should be

emphasized. These are fundamental differences, well correlated with the difference in the pathology of the two diseases, and should serve to distinguish the two.

In order to call attention to this group of cases and to record the apparent beneficial effects of the treatment advocated by Epstein, we are reporting four cases which we have been fortunate enough to observe in the past year. The first three of these fulfill fairly well the clinical criteria of chronic nephrosis. The fourth was diagnosed nephrosis pre-mortem and is reported to show the resemblance between amyloid disease of the kidney and

COMPARISON OF CHRONIC GLOMERULO-NEPHRITIS AND CHRONIC NEPHROSIS		
I. CLINICAL		
	CHRONIC NEPHRITIS	CHRONIC NEPHROSIS
Etiology	Acute infections	Metabolic
Renal Pathology	Inflammatory. Primarily vascular with infiltration and hyalization of glomeruli, and secondary tubular atrophy.	Degenerative. Primarily tubular with minimal glomerular changes.
Symptoms		
Edema	Frequent	Absent
Anorexia	Common	Present
Polyuria	Moderate	Present
Nocturia	Present	Present
Hypertension	Marked secondary type	Absent
Cardiac hypertrophy	Moderate	Absent
Prognosis	Progressively fatal	Doubtful, but
Treatment	Low protein, salt poor diet	High protein, salt poor diet

Chart I. Comparison between chronic glomerulo-nephritis and chronic nephrosis as to etiology, pathology, symptoms, prognosis, treatment.

chronic nephrosis. Of necessity only brief protocols could be submitted, only the essential positive findings being given. The laboratory data are recorded on Chart 2. For the privilege of reporting three of these we are indebted to Dr. S. P. Rees and Dr. E. J. Huenekens. We are also indebted to Dr. M. H. Nathanson for aid in the diagnoses.

CASE RECORDS

CASE 1. D. B. Female, single, aged 21, Greek. Seen with Dr. S. Weisman.

Present Complaint—Edema of ankles and weakness for eight months.

Past History—Mumps, measles, typhoid in childhood. Influenza three years ago.

Present Illness—During the war patient lived in Greece and was on a very restricted diet, particularly lacking in protein. Since influenza has felt weak and tires easily. First noticed edema of ankles three months after coming to this country. Eight months ago first noticed swelling of legs and neck and since then swelling of the whole body varying at times. Feels weak and remains in bed most of the time. Occasionally dizziness and headache and morning

nausea. Has been on a restricted protein diet consisting chiefly of milk for past eight weeks without apparent benefit.

Physical Examination—Head and neck negative except for slight hypertrophy of tonsils. Lungs normal. Heart normal in size and shape with no evidence of abnormality. Abdomen shows palpable liver and spleen, the former being almost normal in size, the latter somewhat enlarged. Ophthalmoscopic examination negative. Physical examination showed no other evidence of pathology other than a very moderate edema of the ankles which had almost disappeared in a short time.

Laboratory Findings—Shown in chart two as Case 1.

Treatment—Placed on a diet from 200 to 240 grams protein, 40 to 60 grams fat, and 200 grams carbohydrate daily, making calories from 1,600 to 2,400 daily. Fluids restricted to 1,800 c.c. During a short time of observation, the albumin dropped from 8 to 2 grams per liter of urine, but edema had practically disappeared before dietary treatment had begun. Patient still living and apparently well at the last report.

Summary—Case of a young girl, showing massive albuminuria, casts, edema, but no red blood cells in the urine, no hypertension, cardiac enlargement, retinitis, anemia, or retention of metabolites, normal P. S. P. Basal metabolic rate minus 25.6 per cent (?). Serum shows reversal of

Present Illness—Eight months ago he first noticed swelling of his feet. He felt perfectly well otherwise. This lasted a month then receded. Later it began again, advanced up his legs. He went into a hospital at Spokane, Wash., where he was treated for nephritis for several months without any improvement. After coming to Minneapolis, the swelling became rapidly worse, finally involving all parts of his body, especially his abdomen. He was tapped several times without any relief. At the present time in addition to the swelling he has palpitation of his heart, dyspnea, and anorexia.

Physical Examination—Marked edema of entire body including lids and face. Scars on neck, forehead, legs, abdomen, chest, some deep, some superficial.

Head: Mouth shows considerable dental caries and pyorrhea. Throat is reddened, tonsils somewhat inflamed. Lips are cyanotic. Axillary glands are palpable. No other glandular enlargement. Neck is negative. Heart shows no definite evidence of abnormality. Teleoroentgenogram shows its size to be well within normal limits. Lungs give evidence of bilateral pleural effusion. This is confirmed by roentgenograms. Abdomen is distended with definite signs of fluid. Liver and spleen not palpable. Back shows edema. Extremities show marked edema. Ophthalmoscopic examination negative.

Treatment—July 12—Diet instituted of 1,000 c.c. milk per 24 hours, one ounce magnesium sulphate daily, hot packs; later put on low protein salt free diet. Paracentesis abdominis was done with removal of 1,600 c.c. milky fluid. Treatment continued five weeks with marked increase in edema and gradual progress in the symptoms. Patient became extremely weak, had acidotic breath and general condition very poor.

August 28th—Placed on diet of 200 grams protein, 70 grams fat and 150 grams carbohydrate fluids limited to 1,000 c.c. between meals and 3 grs. thyroid extract given t. i. d. Within two days output rose from 200 c.c. to 700 c.c. per twenty-four hours. Appetite which was completely gone, restored. Patient brighter, condition greatly improved.

September 5th—Albuminuria reduced from 7.5 to .75 per cent. Output greatly exceeds intake.

September 15th—Serum albumin was 4.4 per cent, globulin 1.87 per cent, total 6.28 per cent. X-ray examination and physical were essentially negative except for slight edema along tibiae and slight albuminuria. Blood chemistry and P. S. P. were normal. Was well for three months after leaving hospital, was then lost sight of and has since been reported as dead. Unable to confirm report or discover cause of death.

Summary—Case of a male Chinese, showing tremendous edema and anasarca, massive albuminuria, casts, rarely red blood cells in the urine, no hypertension, cardiac hypertrophy or retinitis, no marked retention of metabolites, no marked reduction in P. S. P. Serum shows reversal of normal albumin-globulin ratio with evidence of lipemia. While under treatment for five weeks with low protein salt free diet patient becomes progressively worse. Institution of high protein fat poor diet with thyroid extract, is followed by marked sudden improvement until almost completely recovered.

CASE 3. M. G. Male, white, two and a half years old.

COMPARISON OF CHRONIC GLOMERULO-NEPHRITIS AND CHRONIC NEPHROSIS
II. LABORATORY.

LABORATORY FINDINGS	NORMAL (AVER.)	CHR. GL. NEPHRITIS (AVER.)	CASE 1	CHRONIC NEPHROSIS CASE 2	CASE 3	AMYLOID KIDNEY
Urine						
Specific Gravity	1.015	1.008	1.030	1.038		1.026
Albumen	None	0.1%	125%	45%	Massive	Heavy
Casts	"	Moderate	Many	Many	Moderate	Numerous
R.B.C.	"	Few	None	Rare	Rare	
P. S. P.	65%	15%	55%	52%		21%
Blood Pressure	125/70	165/100	115/65	132/84	100/80	152/94
Blood Chemistry [†]						
Urea Nitrogen	18	100-300	98-160	96-328	103-200	130-229
Creatinine	1.5-2.5	35-90	15-	20	24-30	1.8
Uric Acid	35-40	30-100		13-58	33-56	23-29
Sugar	100-140	150-200	90			110
Cholesterol	175-225	150-	330	Milky*	366	240
Serum albumin	4.5%	2-3%	2.18%	5.10%	3.06%	3.7%
" Globulin	8.5%	22-30%	22-30%	5.47%	3.89%	3.36%
Total Protein	13%	6-8%	22%	6.1%	6.47%	7.06%
Blood Counts						
R.B.C.	5 million	2-3 million	4½ million	4 million	4½ million	3½ million
Hgb.	80-100%	40-60%	100%	85%	80%	42%
Basal Metabolism	±10%	±10%	-25.6%	-12%*		
Wassermann	Neg	Neg	Neg	Neg		++++

[†] Mgm. per 100 c.c. blood

* Indicate milk; cholesterolmia

* Patient on thyroid extract

Chart II. Essential laboratory findings in the normal, in chronic glomerulo-nephritis, in three cases of chronic nephrosis, and in one case of amyloid kidney.

normal albumin-globulin ratio but with normal total percentage. Cholesterol of blood increased. Wassermann negative.

CASE 2. S. C. Male, aged 34, married, Chinese. From the Minneapolis General Hospital, service of Dr. S. P. Rees.

Present Complaint—Swelling of the whole body and loss of appetite, weakness.

Past History—Six years ago had a series of multiple infections which had to be incised, leaving scars. This is evidently common amongst Chinese. Three years ago had an illness which caused him to be very dyspneic for a short while but this has since disappeared. He had attacks of fainting during this illness. Otherwise no history of past illnesses is obtained.

Minneapolis General Hospital, service of Dr. E. J. Huene-kens.

Present Complaint—Swelling of face, legs, feet.

Family History—Father died of pulmonary tuberculosis. Twin to patient still-born.

Past History—No previous illnesses whatever.

Present Illness—Mother first noticed swelling of feet and legs one week before admission. No other symptoms.

Physical Examination—No abnormalities except generalized edema of marked extent. The heart and lungs are normal. There is fluid in the abdomen.

Laboratory Findings—Given in Chart 2 under Case 3.

Treatment—Low protein salt free diet for twenty-five days with suitable measures for increasing output of fluid. No improvement whatsoever. Then placed on high protein diet. Two weeks later tonsillectomy with uneventful convalescence. High protein diet continued for four weeks without sign of improvement. During this period he was also given small doses of thyroid extract.

Disease was progressive and patient finally died.

Post-mortem—By Dr. K. Ikeda: Milky effusion in peritoneal and pleural cavities. Generalized edema. Small areas of broncho-pneumonia of recent date in both lungs. Left kidney weighs 72 gms., right, 77 gms. Capsules stripped readily, cut surface pale, swollen and cloudy. Markings well preserved.

Post-mortem Diagnoses—Chronic nephrosis. Generalized anasarca.

Summary—Male child with history of edema without other symptoms. Laboratory findings are marked albuminuria, with rare red blood cells in the urine. Blood shows no anemia, no retention of metabolites, but definite cholesterinemia, and a reversal of the normal albumin-globulin ratio. Treatment by both low protein and high protein diet together with small doses of thyroid extraction was unsuccessful. Post-mortem showed nephrosis of kidneys.

CASE 4. M. J. Female, colored, married, forty years of age. Minneapolis General Hospital, from the service of Dr. S. P. Rees.

Present Complaint — Swelling of limbs for past three months.

Past History—Married twice; two children by first husband; no children, second husband. Usual childhood diseases, occasional sore throats and severe headaches.

Present Illness—For past three months has noticed progressive swelling of limbs and for past two weeks the whole body had become swollen. She had had pains in the back for this same period. For two weeks has had burning urination with a yellowish vaginal discharge. Has been perfectly well up to the present except that menstruation had ceased eight months ago.

Physical Examination—Generalized edema, most marked in lower extremities, but present in face also. Pupils react sluggishly. Tonsils cryptic and injected. Teeth show caries and gingivitis. Ophthalmoscopic examination negative. Moist râles bases both lungs but otherwise essentially negative. Heart normal in size but systolic murmur is heard at the apex, not transmitted. There is fluid in the abdomen.

Laboratory Findings—Put on low protein, salt free diet with limited fluids, and then milk diet with no improvement.

After two weeks, put on high protein, fat poor diet for two weeks and edema continued to increase. Course steadily downward with exitus finally supervening four weeks after entrance.

Post-mortem—By Dr. J. C. McCartney. Free fluid in abdominal and left pleural cavity. Numerous old adhesions in right pleural cavity and in pelvis. Root of aorta shows syphilitic lesions. Spleen adherent to neighboring organs, increased in size, and has waxy appearance on cut surface. Scar in middle. Liver shows several scars with masses of fibrous tissue. Kidney, left 300 grams, right 290 grams. Section shows cortical portion thickened, mottled pink and grayish yellow, but the border between the cortex and medulla is sharp. Aorta shows extensive syphilitic lesions.

Post-mortem Diagnoses — Syphilitic aortitis. Multiple gummata of liver and spleen. Amyloidosis of liver, spleen and kidneys.

Summary—Colored woman of forty with history of edema of three months standing. Physical examination reveals only edema and anasarca. Laboratory examinations show marked albuminuria with red blood cells in the urine, marked secondary anemia, positive Wassermann. Blood shows no retention of metabolic products, a moderate cholesterinemia, a reduction in the serum protein with a reversal of the albumin-globulin ratio. Treatment with both high protein and low protein diet were ineffective. Post-mortem reveals an amyloidosis of the kidneys secondary to syphilis.

Discussion.—Edema and albuminuria, which are among the most prominent symptoms of nephritis, are present in all these cases, and they might easily be diagnosed chronic glomerulo-nephritis. The absence of any infectious etiology, of vascular symptoms, of nitrogen retention, together with cholesterinemia and change in the serum proteins, indicates their essentially different character. In Case 1 should be noted the history of prolonged undernutrition which suggests a possible etiological factor. In this connection it may be observed that chronic nephrosis has been compared to "war edema," the etiology of the latter being a lack of protein in the diet rather than a loss of protein through the kidney. The startling effect of the change from a low protein diet to a high protein, fat poor diet with thyroid extract, should be particularly noted in Case 2. The improvement in the patient was so marked and followed so closely upon the change in treatment, that it is reasonable to conclude the latter was the causative factor. The reduced basal metabolism in the first two cases was definite. In Case 2 the reading was made after the patient had been on thyroid extract for a month. It is reasonable to assume, therefore, that it was subnormal originally. Case 3 showed nephrosis at autopsy. The amyloid kidney illustrates the confusing clinical picture produced by pathology

which involves the glomeruli largely as well as the tubules.

Summary.—Chronic nephrosis is a degenerative process of the tubules of the kidney, of unknown etiology, characterized chiefly by edema and albuminuria, but lacking in the vascular phenomena of glomerulonephritis.

Cholesterinemia, reduction of the serum proteins, reversal of the normal albumin-globulin ratio, are found in chronic nephrosis. In some cases there is a reduced basal metabolic rate.

Three cases which fulfill these criteria, and one case of amyloid kidney, which resembles nephrosis in its clinical manifestations, are reported. A high protein, fat poor diet together with thyroid therapy has been found efficacious in chronic nephrosis. The apparent beneficial effect of this therapy in two of the cases is reported.

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DISCUSSION

DR. M. H. NATHANSON, Minneapolis: I had an opportunity of seeing the cases reported by Dr. Rigler and they were very instructive. These patients come in with large amounts of albumin in their urine and a marked edema, and on superficial examination, they might easily be considered as cases of true nephritis. On further study, however, certain features of nephritis are found to be absent. These are, chiefly, the cardio-vascular changes, the hypertension, cardiac enlargement and retinal findings. There is, furthermore, little change in the blood chemistry in this

condition. There seems to be little doubt that this is a definite clinical entity.

There may be some question concerning the pathology of nephrosis, but the pathological physiology of the condition is quite clear, at least, in regards to the mechanism of the edema. In this, it differs from nephritis. In nephritis, the kidney glomeruli are damaged, either as a result of infection or as a result of vascular changes in the kidney. The function of the kidney is then reduced, and substances usually eliminated through the kidney, including water and salt, are retained and edema results. In nephrosis an entirely different mechanism is operating. Fluid is normally held in the blood and prevented from passing into the tissues by the osmotic pressure of the blood, which is dependent on the serum proteins present. A reduction in serum proteins will allow fluid to pass from the blood into the tissues. According to Epstein, this is the mechanism of the nephrosis edema. Epstein believes that chronic nephrosis is not a disease of the kidneys, but a metabolic disease involving, especially, protein metabolism. As a result of this perversion in metabolism, large amounts of protein are passed out in the urine. There is a reduction in the serum proteins, and fluid passes out of the blood into the tissues resulting in edema. This edema is entirely extrarenal, and depends on changes in the blood instead of the kidney. It would follow, then, that the logical procedure in treatment would be to attempt to restore the serum proteins to their normal level. It is on this basis that high protein diet has been tried, and many successful results in reducing the edema and improving the patient generally, are reported.

The mechanism in nephrosis is probably closely allied to that present in war edema, which occurred in countries where there was a deficiency of protein in the diet. In this, there would be a reduction in osmotic pressure of the blood due to insufficient protein intake, while in nephrosis it is due to excessive protein loss. One wonders whether in true nephritis with edema and albuminuria, we may not be favoring the production of a similar mechanism, by excessive restriction of protein in the diet, as is so often prescribed in the treatment of nephritis.

While chronic nephrosis is apparently a definite clinical entity, there is still considerable to be learned about the condition. It should be kept in mind in any case of edema and albuminuria. Careful study should be made, especially, if the other usual features of nephritis are absent or present in a minor degree.

DR. E. L. TUOHY: Doctor Hirschboeck and I have studied a number of these cases, and I wish to support everything that Dr. Rigler has brought forth. The pathologists find fault with this classification of chronic nephrosis. In passing, we wish to say that any classification of disease is likely to be illogical and to show overlapping, but unless we do classify disease and our knowledge of disease, we work as inefficiently as a library, were it to function without a catalogue or index.

A case referable to this situation, in my practice, concerns a man who was supposed to have chronic nephritis, but who developed what we classified then as a pseudo-chylous ascites. The literature available at that time was chiefly that of Parkes Weber, and I reported the case as

one of pseudo-chylous ascites. In going over the kidney carefully, with a number of men, whose judgment pathologically and clinically was very good, I became cognizant of the fact that this was a typical nephrosis, with changes in the kidney structure involving chiefly the tubules and the intertubular tissue. Clinically, this patient's course was a counterpart of those in Doctor Rigler's experience.

Eppinger, Huck, as well as Volhard and Fahr, have aided a great deal in the classification of renal disease. As far back as 1912, Eppinger advised higher protein feeding in these cases. It is not uncommon in nephritis to have what the Germans call "ein nephrotischer anschlag," in which we have an overlapping of symptoms, in part typical of glomerular disease and in part, manifestation of a tubular degeneration.

DR. H. T. HELMHOLZ: I should like to call attention to some work that has been done by Doctor Marriott, of St. Louis, in connection with chronic nephrosis in children. The emphasis has been placed, both by the essayist and in the discussion, on the absence of infection in this type of case. In this series of cases, which I think is twenty-seven, he found in the great majority an infection of one of the sinuses. It was shown that the organism that seemed to be the causative factor was the staphylococcus and that the nephrosis disappeared with the drainage of the sinuses. Certainly in this type of case there seems to be a very definite relationship to infection.

DR. LEO G. RIGLER, Minneapolis: With regard to Dr. Tuohy's experience with pseudo-chylous ascites, it may be of interest to note that we found a very milky fluid when we did a paracentesis abdominis on Case 2. His remarks on subacute nephritis are of interest as a critical examination of the cases of subacute nephritis reported by Christian, who does not recognize nephrosis, indicates that some of them certainly belong in this group.

THE PHARMACOLOGY OF CARBON TETRACHLORID

The most recent claimant for recognition as a means of removing hookworms is carbon tetrachlorid. The moderate cost of this chemical has enhanced its popularity. As the product appears in commerce in a variety of forms for use for different purposes, the A. M. A. Chemical Laboratory studied the quality of the market supply and elaborated standards that might serve to identify products suitable for medicinal purposes. As a result of this study, the Council on Pharmacy and Chemistry adopted standards for carbon tetrachlorid medicinal and listed the brands that complied with these standards. The remedy is comparatively safe, though serious symptoms and even death have been reported from its use, especially in patients addicted to the use of alcohol. Pharmacologic investigation has shown that the substance is relatively non-toxic because it is not readily absorbed from the intestinal canal. Severe intoxication results if the drug is introduced into the tissues directly through the circulation, as by inhalation, or if its absorption is favored by the presence of fats or of alcohol in the stomach and intestines. Hence, alcohol and fats—even milk, perhaps—are to be avoided when carbon tetrachlorid is administered.—(*Journal A. M. A.*, April 19, 1924, p. 1268.)

PSYCHO-NEUROSES*

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We have never had a term in our nomenclature so comprehensive in itself and at the same time so expressive of a vast number of conditions which have been grouped heretofore under various titles as the hyphenated word—the psycho-neuroses. This designation includes them all. Our previous classifications have been descriptive, made according to terms which their symptomatology suggested. The word psycho-neuroses is made on an entirely different basis, that of their origin, as revealed by the inherited tendencies of the individuals classified under this term. Many of the conditions now enrolled under this heading have heretofore been regarded as separate entities, such as epilepsy, migraine, hysteria, dipsomania, melancholia, acute mania, the asocial and anti-social types, such as vagabonds and loafers, as well as the criminals and delinquents of all kinds. A definite relationship is now recognized on this basis. An epileptic mother or a spree drinking father very seldom pass on to their offspring the identical conditions from which they themselves suffer, but what they do transmit is their unstable and defective nervous systems of which their own afflictions are merely manifestations.

D. A. Thom and Germa S. Walker, after the study of the ascendants of a large number of epileptics, state, in their opinions, that epilepsy as a disease is not transmitted directly from parent to offspring, but rather it is the nervous system lacking in normal stability that is inherited and the manifestation of this instability may be mental deficiency of all degrees, insanity of various types and neurological and psychopathic disorders.

Our own case histories, with few exceptions, which often on further information turn out not to have been exceptions, are continually corroborating the conclusions just cited.

Concerning the well known laws of Gregor Mendel on inheritance, Voss says: "It is rather strange when a biological law is fully accepted as true both for animal and plant life, that it should fail in its application to man."

Galton's law of ancestral inheritance may also

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be mentioned as confirmatory of transmitted mental trends. Jelliffe in his book "The Technique of Psycho-analysis," speaking of the unconscious, in the sense of our historical past or ancestry, says that "its influence is to the conscious as a million years is to the present moment."

Looking aside from statistics and conclusions on the subject of inherited tendencies, because one always encounters contradictions no matter how poorly justified they may be, one may cite concrete instances of such inherited tendencies in such celebrated families as that of the Juke family in New York and the Kallikak family in New Jersey.

The Juke family has been traced through nine generations both in their original and in different environments. Stoddard, in his book, the "Revolt Against Civilization," says of this family, "the same feeble-mindedness, indolence, licentiousness and dishonesty showed itself in this family through all these generations, even when not handicapped by the association of their bad family name and in spite of better social conditions."

The same author mentions the Kallikak family as a remarkable example of how superiority and degeneracy are alike rigidly determined by inheritance. Martin Kallikak, a young revolutionary soldier of good stock, had an illicit love affair with a feeble-minded servant girl by whom he had a son. Some years later Martin married a girl of good family by whom he had several children. This is what happened. The children by the woman of good stock all turned out well and founded one of the most distinguished families in New Jersey. On the other hand the descendants of the feeble-minded girl stand out in sharp contrast. Of these 480 have been traced—143 were clearly feeble-minded, 36 illegitimate, 33 grossly immoral, 24 confirmed alcoholics, 3 epileptics, 82 died in infancy, 3 were criminals and 8 kept houses of ill fame.

Examples similar to the Juke and Kallikak family might be duplicated in every community if careful studies were made of the ascendants of the occupants of our penal institutions, our state hospitals for the insane and feeble-minded, as well as the frequenters of our criminal and delinquent courts.

A study of the mechanisms through which this ancestral stream descends is interesting.

We can readily understand that a difference in pigment makes the eyes brown, blue or hazel, hair

black or red, but the problem becomes more complicated when we are asked to explain why one person is brave, another a coward, one cruel, another tender-hearted. Unfortunately there are as yet no anatomical differences in cell morphology which either the highest powered microscope or the most delicate stain is able to recognize between nerve cells which in their reaction exhibit these antagonistic qualities. Yet such qualities are the effect of nerve cell function. They can be explained on no other basis any more than the difference in the color of eyes may be explained in any other manner than by the difference in the degree of the pigment.

To say that the material basis for this variation in qualities which go to form personality and character rests entirely upon biopsychological processes due to evolutionary changes both in structure and function which have been occurring through the eons of time, beginning with the first particle of protoplasm, is not entirely satisfactory or understandable to the most of us.

It is only by a study of the nervous mechanisms which make possible and satisfy the cravings of these biological processes that explanations and foundations begin to appear.

The autonomic nervous system is the primitive nervous apparatus which furnishes the nerve supply of the smooth muscles, visceral and skeletal and all the glandular structures. White, in his book, "The Foundations of Psychiatry," says "this system operates through the endocrine glands and their hormone secretions to bring about balanced interrelations which play a most important part in the integration of the organism as a whole. In other words, the autonomic nervous system registers the organic needs of the organism, the psychological aspects of which are the effects." This same author also says "the function of the cerebro-spinal nervous system is to bring about a satisfaction of the organic needs."

To illustrate the relationship of the two nervous mechanisms, hunger, for example, is an affective craving testifying to an organic need, produced by the action of the autonomic nervous system on the peptic glands furnishing the stimulation to them in the secretion of gastric juice, as well as the stimulation for the contractions of the stomach musculature. The effect of the autonomic nervous function is to register an organic need in the form of a craving in the nerve cells of the brain, the central

organ of the cerebro-spinal system. The result is, that the cerebro-spinal apparatus so relates the organism to its environment as to secure food and thus satisfy the disagreeable sensations which the craving has brought about. In this simple illustration the mechanism of all our instinctive cravings may be explained, such as thirst, sex, need of rest, sleep, exercise, etc. Under normal conditions the physiological needs of the organism are made known through the autonomic apparatus and the cerebro-spinal system finds the means of satisfying them.

In psychological terms, the endeavor on the part of the organism and its lower nervous apparatus for the control of its higher, the cerebro-spinal or what may be called the psyche, creates a conflict.

Out of this conflict the emotions are born. According to White the emotions are the result of cravings which are not for the time being able to secure the pathways of the psyche for their satisfaction. Kempf has aptly described the emotions as the psychological reverberations of the conflict. The nature of the outcome of this struggle determines the character of our emotions as to whether they have a normal expression or are repressed and distorted. They are to the psyche in its natural normal development what exercise is to the body. These cravings, then, and manner of their control on the part of the psyche, constitute personality. It is evident that in any understanding of personality an appreciation of the impressionability and capacity of these two nervous mechanisms is fundamental; a knowledge of the nature and extent of the control on the part of the psyche; the type and intensity of the lower stimuli is all-important. This may be illustrated in a variety of ways. One of the simplest examples may be taken from animal psychology. We all recognize the futility of trying to make an animal enjoy a symphony or appreciate the painting of a Raphael. The external stimuli for its ear and eye may be more acute than yours, but there is lacking the nerve cells in the animal's receiving apparatus to transform these stimuli into appreciation and pleasure. There are no psychological reverberations, so to speak, no emotional thrills as the result of them.

Another example of a different character illustrating a vicious craving and its psychological reverberations: A boy had attacks of epilepsy. Both his father and brother were spree drunkards; under treatment, the epileptic attacks were trans-

formed into spells of agonizing thirst coming on with the regularity of his former epileptic seizures. These entirely strange sensations to the boy disturbed and frightened him even more than his epileptic attacks. The near relationship of these two symptomatically widely different conditions may be seen in the inherited deficiencies of the two nervous mechanisms, abnormal cravings or stimuli as the result of hypertonicities and tensions in the autonomic or lower nervous apparatus, hypersensitiveness in the nerve cells of the psyche or upper as an effect of medication stopping the reaction of the nerve cells in one place perhaps more susceptible to it and the expression of the abnormal stimuli in another location in the psyche less affected.

This case is also interesting in that it shows both the physiological and psychological mechanism or levels involved in spree drinking as well as the variation in response to similar stimuli. In the boy in the first instance, the stimuli expressed themselves in the form of epileptic seizures, then later as sensations of a vicious thirst. The psychological level of the boy also reacted differently from that of his father and brother in that he endured his cravings instead of yielding to them as they did.

We may also find in this case a good example of what has been called the conditioned reflex and understand more clearly the significance of Jelliffe's statement, when he says: "Our historical past, meaning the unconscious, is to our present consciousness, as a million years to the present moment." By the slow process of evolution and the individuation in this process, naturally occurring in different families, both of structure and function, the nervous mechanism in this family was conditioned, that is rendered more susceptible, or, stating it in a different way, predisposed to such reactions because of this historical past. The father and brother perhaps conditioned themselves in a part of their reaction by seeking to satisfy their cravings with liquor; the boy never having been conditioned in this manner of relief, suffered them out.

The psychological reverberations of affective cravings or hypertensions do not always manifest themselves in the same way in the same individual.

The period of life and its changing functional activities may influence them greatly. As an example of this: A patient had severe attacks of migraine coming on regularly at her menstrual

period and lasting for a day. After her menopause the character of her migraine attacks was entirely changed. Instead of the severe pain which she suffered before, she experienced at about the same interval one day of intense mental depression, so severe that she walked the floor, tore her hair and was possessed of strong suicidal impulses. This case is another illustration of the imperfect function on the part of the autonomic nervous mechanism, expressing its vicious stimuli in a different brain localization at another period of life. It also shows the close relationship which exists between physical pain, endogenous in origin, and what may be called physiological emotional disturbances, that is, emotional disturbances in an individual so predisposed or conditioned by inherited tendencies which seem to be independent of environmental influences.

The psychological effect does not always by any means exhibit itself in one severe attack like reverberation. In fact, by far the greater number of psycho-neurotic reverberations may express themselves by more or less continuous rumblings as the constant complaints of such patients frequently demonstrate. A migraine headache may resolve itself into a persistent neuralgic condition, quite general in character, an acute depression may become chronic.

Fortunately in a large number of those so predisposed, the predisposing cause is in itself not sufficient, under favorable physical and social conditions, to disturb the normal harmonious adjustment of these mechanisms. What may be called an exciting or precipitating factor is needed to disturb their balance. From the endogenous standpoint we observe many times the harmful influence of the precipitating factor at the age of puberty when new and powerful stimuli begin to register their effect on the nerve cells of the brain receiving mechanism because of the greater activity of the sex glands and consequent increase of organic needs. We see many children who seem well adjusted up to this period of their lives; but when these new stimuli come in, so necessary to the full development of the normal individual, their higher nervous mechanism does not seem able to stand the strain and the evidence of their overstress shows itself in many directions. This is a favorite period of life for the development of the psycho-neuroses. The condition is comparable to an electric light decoration, where the bulbs containing the delicate

shades required to preserve the harmony in the color scheme are of a lesser candle power than the more glaring colors, and when enough current is used to illuminate the latter sufficiently the bulbs representing the quieter shades may be burned out and thus the harmony of the whole decoration is spoiled. At the climacteric we observe the opposite in reaction. In this period of life the current necessary to make the bright colors shine in their full lustre begins to diminish, their lights grow dim and the illumination, for a while at least, during a period of readjustment, fails in the purpose of the decoration. The bright colors are gone; only the dull, quieter shades remain.

The precipitating factor of exogenous origin appears in a thousand different ways. Anything which lowers nutrition, and in this manner disturbs function, such as focal infections, general infections, et cetera, may contribute to it. In the psychic sphere, one who stammers may only do so when under sudden excitement; a sick headache may require some sort of nervous strain to bring it on. A nervous breakdown occurs as the result of severe stress or sudden shock.

Such predisposed or conditioned patients must be examined from every angle. Heretofore we have contented ourselves with a physical examination, or perhaps a Simon Binet mental test, and when no satisfactory explanation for symptoms could be given we have defended our ignorance by a skeptical and unsympathetic manner towards the patient, and thus have failed of success with him.

We have acknowledged the reality of the pain in migraine, the unconsciousness in epilepsy, but have not appreciated this factor sufficiently in such conditions as hysterical attacks, emotional states and various conduct disorders, because we have not recognized the relationship between them. Such disturbances should be regarded as the effect of dysfunction in the nervous mechanism just as truly as the reactions of pain in migraine and of unconsciousness in grand mal.

In a recent article on the psycho-neuroses, Macfie Campbell has formulated what he considers as essentials in the examination of these patients.

1. He mentions the determination of the functional efficiency of the various systems of the body, such as the cardiovascular, respiratory, et cetera. Among these systems he says two have a very special importance, the central nervous and autonomic

or endocrine systems, because defects in other systems are compensated to a certain degree in a variety of ways, while inferiority in the endocrine or central nervous system strikes in a very fundamental manner at the behavior of the individual.

2. The constitutional equipment of the patient as regards the fundamental emotional reactions.

3. The special experiences in the life of the patient which may have sensitized him to special topics or situations (as in the conditioned reflex).

4. Physiological factors in relation to the mode of life such as excessive work and consequent fatigue, etc.

5. The actual life situation, such as an unsuitable marriage, distasteful work, uncongenial social environment, etc.

The thought may naturally occur that since these things are all so basic and inherent in the patient, this is in the nature of a Calvinistic creed which has foreordained our course generations before we were born. No doubt many of us can remember a time in our adolescence when glaring colors were about the only ones the limited vision of our consciousness could see. The beauty of the more subdued and harmonious hues made no appeal to us. It was only by the intelligent discipline and direction of our parents, and the stimulating influence of a helpful environment, that we finally began to see them. In the light of this later extended vision we were scarcely able to account even to ourselves for our former conduct. Fundamentally we were not changed; we were only balanced by the bringing into action of dormant and undeveloped qualities. There are many individuals whose illumination in consciousness consists chiefly of colors which jar. They seem to antagonize their environment as well as irritate and excite themselves. When these individuals come to the physician they do not complain of these things. It is quite likely they do not realize them, or, if they do, only vaguely, and are not willing to admit the truth even to themselves. They come complaining of most everything else, but never a word of the real cause. They come complaining of headaches, backaches, lack of concentration, sensations of weakness, gas bloating, a general depressed feeling, et cetera. Our first obligation to such patients is to accept the reality of their symptoms. If there is no physical cause, there must be a psychic or, more strictly speaking, physio-psychological one. We should find out what they have been predis-

posed or conditioned to in their family tendencies. It is surprising how the conditioned reflex reaches down from our historical past. Those who have had the opportunity of treating two generations realize this the best.

In our own work we recall many patients whose nervous symptoms in the way of fears, insomnia, chronic apathies, depressions, were just as much family symptoms as the family features. One patient had a fear of being alone. This fear possessed her to such an extent that during a period of twelve years she had never been alone at home or gone out alone. Her grandmother had the same obsession. Another patient at the age of 35 began to manifest certain paranoid ideas with reference to his family and neighbors. The patient's father held the same ideas at the same age. Such illustrations might be multiplied indefinitely.

A very good criterion by which to judge of the prognosis in such cases is by the course these manifestations took in their predecessors. Since they were evidently endogenous in origin, they bear a much more serious import.

The conditioned reflex, whether it comes to us from our historical past or is one of our own acquiring, often gives the key to the symptoms complained of. A young lady suffered a severe depression. By a careful inquiry into her personal history it was found that she quit school during her first year in high school because she could not bear to get up before the rest of the class to recite. Gradually she became so sensitized to such situations that she stayed at home most of the time because of her fear of meeting people. The depression was a natural consequence.

Many such patients come to their physicians fighting phantoms. They have fixed on some physical ailment, some bodily disease from which they imagine they suffer, and very often indeed over a period of months and years they pursue a weary way seeking relief in this manner. These patients are inadequate either in their bio-psychological processes alone or because of life conditions. Very often there is a combination of both causes.

In order to have at least some understanding and appreciation of this class of cases, more attention must be paid in our examination to these physio-psychological mechanisms and their psychic reverberations. We must try to gauge their capacity, search into their conflicts, repressions, fixations,

regressions, compromises, symbolizations, elevations and sublimations in the same painstaking and careful manner in which at present we conduct our physical examinations.

SUMMARY

The psycho-neuroses are definitely related through the individuating evolutionary processes of inheritance.

It is the unstable nervous structure rather than symptoms and types which is transmitted.

In the psycho-neuroses, defect in the nervous mechanism is the primary factor; dysfunction in the endocrine system *per se* should be regarded as secondary.

Special methods in examination such as indicated are an absolute essential.

The success of treatment depends upon our ability to judge the capacity of these nervous mechanisms with reference to the normal; expose their so-called conditioned reflexes, both inherited and acquired, and establish balance and adequacy in their reactions so far as possible.

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DISCUSSION

DR. A. S. HAMILTON, Minneapolis: I am glad that in bringing this matter of psycho-neurosis before the society Doctor Engberg has emphasized the importance of mental mechanism, the state of mind, in the production of the multiform symptoms from which these psycho-neurotics suffer. I think we need to be reminded of that quite frequently. I think the tendency is rather the other way, I mean to attach undue importance to bodily states rather than to over-emphasize the mental aspect.

In spite of the fact that attention has been called to this many times, in spite of all this suffering that psycho-neurotics experience, the lot of the psycho-neurotic is still an unhappy one in the medical world. I am sure that to the great majority of physicians, even to this day, the ordinary psycho-neurotic is an unmitigated nuisance and is dismissed as quickly as the physician can or feels that he dare get rid of him.

I do not want to enter into any prolonged discussion as to the relative importance of bodily conditions as against mental states in producing these symptoms. Doctor Engberg has pointed out that the first duty in the study of these cases is to make a careful autonomic study but when that is complete one is not to assume that the whole thing is done.

I think it is quite possible to overemphasize these autonomic conditions.

Psycho-neurotics complain of many things. That is why they are so burdensome to doctors. It takes so long to go over their record and I think I am safe in saying that no psycho-neurotic ever feels that his case has been properly studied or is well understood until he has had a chance to get off his chest every one of his complaints. I know that every one who deals with these patients has had this experience, that the patient will come back to the office and tell two or three things that he had forgotten. They may be to the physician something wholly immaterial but the patient seems to feel that unless the doctor has all this at his command he cannot understand the case satisfactorily.

The first thing, therefore, is the very careful study of the facts in the particular history of the patient, who will lay before you all of his complaints. It is necessary to make a very careful physical examination. As Doctor Engberg has emphasized, when that is done one has usually won the confidence of the patient. The patient may feel in the end that you do not do him any good or have not done him any good but at least when that much is accomplished there has been a very thorough study of the case and the patient has been led to believe that the doctor does actually sympathize with the multitudinous suffering of the individual. He feels you are making an honest effort to cure his troubles and it puts one on a basis which is at least satisfactory.

DR. HENRY WOLTMAN, Rochester: Dr. Engberg has presented this very important subject in a remarkably clear and able manner. On reading over his paper a good illustration of a phobia based on a conditioned reflex occurred to me. A traveling salesman, suddenly and without apparent cause, found himself in such great fear of getting on a train that he had to give up his occupation. He could leave town in an automobile, but could be induced to board a train under no condition. Further inquiry revealed that on his last trip he had suffered from an attack of diarrhea. It also disclosed the fact that many years before his mother had told him that when he was three years of age, she took him on a train where he developed diarrhea, followed by terrific epileptiform seizures. These seizures continued until he was seven years of age. Since then he has been in mortal terror lest these attacks might return. The phobia concerning the train was actually a fear of epilepsy touched off by the recent attack of diarrhea while on the train. The long interval of time that had elapsed left this conditioned reflex somewhat distorted.

The mechanism in some cases is very simple. For example, a woman complained of blindness of three months' duration. Inquiry showed that this blindness had come on very suddenly. One evening as she was looking out of the window, she saw her husband trudging across the field toward the house. Her vision failed at this moment. As she confessed, she hated the sight of her husband and, subconsciously, by becoming blind, excluded him from her life. When this was apparent to her, vision returned.

That comfort and prosperity alone do not suffice to keep us happy is shown by the fact that there are more suicides on warm, bright, and sunny days than there are on cold and gloomy days, also that there are almost no suicides during catastrophes such as the San Francisco earthquake.

The problem of handling the psycho-neurotic, in all but exceptional cases, is the problem of every physician.

May I ask Dr. Engberg whether he gets any help in the analysis of these cases from dreams?

DR. EDWARD J. ENGBERG (closing): I wish to thank the society for the interest with which it has listened to this paper and I wish to thank those who have discussed it so nicely. I am sorry that Doctor Ball was not here to discuss the paper because it is a combined effort on our part to present this subject. The immediate reason for presenting it was twofold. One is that so many of these patients come to us and tell us of the various doctors they have been to, and they say: "So-and-so said it was nervous trouble, but he said there was nothing to do for nervousness." I think it is certainly a mistaken attitude to take. It results in this type of patient leaving the ethical profession and seeking what help can be obtained through other sources. The other reason is the tragedies we still see at times (though not nearly so frequently as formerly)—needless operations on this type of patients which often increase their disability.

In regard to Dr. Woltman's question: we make use of the patient's dreams to help the study of the case whenever possible, although usually we find that other methods of determining the patient's psychic state are more readily accessible and dependable.

PROHIBITION OF NARCOTICS SALE BY INTERNATIONAL LAW

Although the use of "dope" is on the decline in New York and many other cities, the problem of the drug addict will never be solved until its manufacture and sale are entirely prohibited by international law, says *Hygeia* in its May issue.

Ninety-eight per cent of all drug addicts in New York state have admitted frankly that their use of a drug is due to association with other persons who are addicts and that there was no reason, such as disease, which caused them to begin the use of narcotics. The remaining 2 per cent gave various reasons, principally surgical operations or illness.

Those addicts who have developed the habit accidentally, says the magazine editorially, can be relieved by discontinuing the drugs, but those who take narcotics because they are weak personalities have slight chance of being cured of the habit so long as drugs are obtainable.

Morphin is the drug said to be most preferred by Middle West addicts, while heroin takes the lead in the East and cocaine in the South. The availability of the drug seems to determine the nature of the majority of the addictions.

New York has become the center of established underground traffic in heroin, it is explained, and it has developed into a large business with distributing depots in pool-rooms, saloons and gathering places of criminals, and with peddlers developing the trade.

During the past three years, the use of drugs has decidedly decreased, investigations show. Beginners are now rarely found among the addicts taken up by the police. While 10 per cent of the addicts arrested are women, it is believed that the percentage of feminine addicts is much greater, for women seldom make their purchases on the street as do the men.

CONGENITAL SYPHILIS OF THE NERVOUS SYSTEM WITH A REPORT OF JUVENILE TABES IN TWINS*

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H. R. Dean¹ has stated that the gross brain changes due to congenital syphilis are not compatible, as a rule, with the continuance of life. Aside from such accidents as hemiplegias and the like, the nervous system changes naturally divide themselves into two types: those due to anomalies in development which occur before birth and those due to actual pathological changes in the progress of the disease.

W. T. Heiman² advances the hypothesis that the syphilitic infection is transmitted to the embryo during its most important period of development and that the struggle to overcome it takes place both before and after birth. The child may, therefore, display not only all sorts of developmental anomalies, such as mental retardation, even to the degree of idiocy, physical deformation and dystrophies, but actual pathological alterations as well. In these respects only does congenital syphilis differ from syphilis acquired after birth.

The degree to which the fetus is damaged by the infection depends upon several variable factors. Probably the most important is that expressed by Kasowitz' law, that the nearer the infection is to the conception the more severe the effect upon the fetus; the further in point of time, the milder the effect. Raeder³ reports thirty cases of congenital infection and emphasizes the relation of the element of time in the infection of parent and fetus.

It is impossible to judge how frequently the nervous system is involved because only children who survive can be observed. Hochsinger⁴ found 43 per cent of 112 cases exhibited clinical signs of nervous syphilis. Rumpf⁵ observed it clinically in 13 per cent of his cases. If we include the anomalies of development such as mental retardation, insanity, hydrocephalus, epilepsy, Little's disease and psychopathic inferiority, when due to syphilis, along with pupillary phenomena, optic atrophy, chorea, tabes, paresis and diffuse cerebro-spinal syphilis, probably the nervous system is involved

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in nearly 50 per cent of the cases. The experiments of Marie and Levaditi seem to point toward a difference in the strain of spirochetes causing general paresis and banal syphilis. Their case is not completely proven. Zabriskie⁶ reports banal syphilis in a parent causing general paresis in the offspring.

Perhaps the difference in the manifestations of congenital syphilis may be explained in this way. Infection by a fresh virulent form of syphilis is more apt to cause physical deformity and nervous anomalies in the offspring, while, as the disease in the parent becomes more latent, thus more nearly approaching the time for the development of late nervous syphilis, the physical manifestations may be less marked and the probabilities of developing late congenital nervous syphilis may become more imminent.

Fraser and Watson⁷ comment upon the comparative rarity of the stigmata of syphilis in children suffering from nervous syphilis. Zabriskie⁶ reports an elder sister who displayed notched teeth and no signs of nervous syphilis while the younger brother suffered from general paresis, but was free from the stigmata. The cases here reported at present show few stigmata but suffer from nervous syphilis.

The signs and symptoms which the two cases to be reported present, at present justify a diagnosis of juvenile tabes; however, as a certain number of such cases eventually develop paresis or taboparesis, only the lapse of time will substantiate or reject such a diagnosis.

In the further discussion of congenital nervous syphilis only those phases of the disease which have a bearing on the two cases to be reported will be considered.

The girls, Margaret and Irene, are ten years old. Their father is in a state hospital with general paresis. He acquired syphilis two years before his marriage. He was treated for a year after his infection and has continued his treatment, at intervals, ever since. Their mother has a positive blood Wassermann, has had intensive treatment and shows no clinical signs of nervous system syphilis.

The children both had a skin rash in the first two weeks after birth and both received salvarsan. Three months later their mouths showed some sores and they were given further treatment. This was continued for a year. During this time they seemed quite well.

Margaret was well until she developed pneu-

monia in her second year, followed by pleurisy and a double otitis media. The otitis became chronic and lasted until she was five years old. She did not walk until she was past her second year and then only with the aid of braces. She began to talk at about two and a half years, but her speech was thick and difficult to understand. As a young child she was nervous and irritable and was often troubled with frontal headache. At six years she had an interstitial keratitis which lasted about a year and during this period her eyesight was reduced so that she could only count fingers at two feet. She occasionally walks in her sleep but has no enuresis.

Mental Examination.—In 1921, when she was eight years old, examination by the Stanford Binet Scale placed her mental age at six years and eight months. In 1923, the tests repeated, placed her age at six years and eleven months, an increase of three months in two years. She is in the second grade in school. Aside from the mental retardation there is nothing of importance in her mental condition and no speech defect.

Physical Examination.—She shows none of the stigmata of congenital syphilis except that her height is not quite up to the average. Her ear drums are retracted. Her vision allows her to read fine print with the aid of glasses. The reflex to light and accommodation is present in both eyes. She has a nystagmus in both eyes, most marked in looking to the right, both rotary and horizontal. Her eye grounds show a primary optic atrophy. The fundus is otherwise quite normal. Her reflexes are normal and all present. No muscular hypotonus. Sensation is normal, excepting an area of diminished perception of pain over her nose and the parts of the cheeks adjacent to it.

Spinal fluid examination gives a negative Wassermann reaction, cell count of 22 per cm. and a trace of globulin. Blood Wassermann is positive.

Irene's history is similar to her sister's, regarding infections. While cutting her teeth she developed an ulcerating sore on her mouth, giving her rhagades. At six years of age her mother noticed a marked inequality in her pupils. At seven years she had a corneal ulcer; at eight years, an extensive herpes zoster covering the entire right side of her chest. She gives no history of enuresis, lancinating pains or crises.

Mental Examination.—An intelligence test in 1923 places her mental age at eight years and nine

months, an addition of twelve months over the previous test in 1921. She is in the fourth grade in school and gets good marks in her studies. The examination discloses nothing abnormal.

Physical Examination.—Except for rather coarse hair, rhagades and diminished height, she displays none of the stigmata of congenital lues. Her hearing is good in both ears. Her right pupil is widely dilated and does not react to light; accommodation and the consensual reaction are present in both eyes. Eye grounds are normal. She displays no other abnormal physical findings.

Spinal fluid Wassermann positive, cell count 30 per cm. and a trace of globulin.

The diagnosis rests on comparatively few signs, a positive serology, blunting of sensation over the face in one case and the eye-signs.

Juvenile Tabes.—Ocular symptoms are of especial importance in juvenile tabes, not only because of the frequency with which they occur, but because they are often so specific as to allow interpretation on a luetic basis, of such indefinite complaints as incontinence of urine, lightning pains and gastric crises.

Optic atrophy occurs in between 40 and 45 per cent of the cases. Cantonnet's⁸ series, 53 per cent of 89 cases; Parkers',⁹ 70 per cent of 10 cases; and Marburg's,¹⁰ 33 per cent of 34 cases. It is usually primary in type, but according to Hawthorne¹¹ the nerve head may be involved in the ruin of a choroïdo-retinitis or in a disseminated choroiditis.

Argyll-Robertson pupils are present in about 80 per cent or the same frequency as in adult tabes. When present in a given case they are almost certainly diagnostic of syphilis as they occur otherwise only in rare cases of lethargic encephalitis and in tumors of the mid-brain.

Irregularity and inequality of the pupils are frequently noticed.

The following description of the behavior of Irene's pupils by her mother is valuable for its accuracy. She states that at six years of age the girl's pupils would be of equal size when she arose in the morning. As the day passed, her right pupil (which is the one inactive to light now) would gradually grow larger until they were very unequal. During the ensuing year her pupil seemed to dilate earlier in the day until finally it was constantly large. This type of pupillary inequality, gradually increasing as the day passes, is characteristic of weakness and gradually approaching paralysis

of the reflex arc and it is frequently due to syphilis.

Transitory diplopia and ocular palsies are said to occur late in the disease.

Nystagmus may be due to some obstruction in vision before the child reaches the age at which visual fixation takes place, or it may be due to a lesion in the vestibular pathway.

Failing vision, headaches, lancinating pains, urinary incontinence and crises are among the earliest and most common symptoms.

Headaches are quite common, particularly when there is a visual defect. They are frequently frontal in character, but occasionally they are hemicranial and of the nature of migraine.

Lancinating pains may be mistaken for rheumatism or growing pains. A diagnosis is often difficult, especially if they come on before the eye-signs. If it is remembered that, contrary to the pains in rheumatism, which are most pronounced about the joints, tabetic pains shift from place to place, but always rest in the muscle, or tissues away from the joints, and that handling or moving the parts does not increase the pain, it is easy to distinguish them.

Urinary incontinence may be mistaken for enuresis, especially if it occurs at night. Ammoniacal odor on the clothes of children, if not due to carelessness, is suggestive.

Gastric crises are difficult to diagnose in childhood, especially in the first attacks. The pain usually precedes vomiting and spreads rapidly to the back, lower abdomen and into the groins. Characteristic of a crisis is the fact that after the most intense pain and vomiting, which may last for days, firm palpation of the abdomen elicits no rigidity and does not seem to increase the suffering and that, in spite of it all, the appetite generally remains good.

Parker⁹ gives the average age of onset in his series as 14 years. Cantonnet's⁶ ages averaged 15. Hirtz' and LeMaires'¹² series 14.3. It may occur at an earlier age as in the cases here reported where it was discovered at eight years. The course is slow and protracted, from five to twenty years may elapse in its development. The full blown picture does not usually appear until after childhood. As the disease progresses, ataxia, loss of knee and ankle jerks, sphincter disturbances, muscular hypotonus, sensory disturbances, ulcerations, arthropathies and progressive loss of locomotion supervene. Herpes zoster occurs rather frequently. Probably the lowered re-

sistance of the diseased tissues makes it more easy prey for the offending organism. The pathology is reported as similar to adult tabes.

Mental Retardation.—Kuhlman¹³ thinks that congenital syphilis occurs no oftener in the institutions for the feeble-minded than among the population in general. This may be true and the following is not intended to convey the idea that syphilis is a preponderant factor in the etiology of feeble-mindedness; but given a series of congenital syphilitics, the number of backward children will be much greater than in a similar number of uninfected ones. Hustens¹⁴ reports 7 out of 14 as retarded. Breuer¹⁵ in 42 cases found 11.9 per cent quite normal, 30.9 per cent slightly backward, 42.8 per cent markedly defective and 14.4 per cent idiots. Mott¹⁶ is of the opinion that syphilis may cause feeble-mindedness without gross pathology in the brain. Logically, gross brain defects might be expected to result in intellectual loss. Fraser and Watson⁷ found serological evidence of syphilis in over 50 per cent of feeble-minded cases suffering from paralysis of some type. Convulsive seizures, hydrocephalus, hemiplegia, diffuse cerebro-spinal syphilis, blindness and deafness often accompany feeble-mindedness. Aside from the frequency of such gross pathology, there is nothing characteristic of the type of retardation which syphilis brings about.

Serology.—About 10 per cent of adult syphilitics develop tabes, paresis or cerebro-spinal syphilis, according to Pilcz,¹⁷ who observed some 4,000 luetic Austrian army officers over a period of from ten to thirty years. From an examination of the spinal fluid alone the incidence in children is much higher. A positive Wassermann reaction on the spinal fluid is generally accepted as evidence of nervous system involvement. However, in dealing with known syphilitic individuals, it is best to consider every other abnormal spinal fluid finding in the light of real or potential pathology. Such changes as are displayed by an increased cell count, increased pressure, globulin, goldsol, Pandy and Mastic reactions are evidences of tissue changes. In judging increased pressure it is well to keep in mind that excitement and an increased respiratory rate are likely to bring about a temporary increase in spinal pressure, so that to be accurate it should be taken under anesthesia and measured by a manometer. From the spinal fluid changes alone, Kingery¹⁸ found 28.8 per cent of 52 cases to be abnor-

mal. Jeans¹⁹ 25.8 per cent of 136 children to have positive spinal fluid Wassermann. The effect of treatment upon the serology has been investigated by Breuer,¹⁵ whose findings in sucklings and older children are here quoted at some length. He found the fluids of sucklings who were receiving full treatment to be uniformly negative. The older children's ages averaged eight years and four months and they had been treated until their blood and spinal fluid Wassermann reactions were repeatedly negative after a pause of three months and a provocative salvarsan. In such children he found pathology in the spinal fluid in 73.2 per cent. Many of these children had been the material of a study by Müller and Singer²⁰ three years previously, who from their results advanced the hypothesis that most of the effects of congenital syphilis can be diminished if not removed by competent treatment. Breuer seriously questions these conclusions and believes that the prognosis for the congenitally syphilitic should be made with the utmost caution, notwithstanding the very best treatment. For in addition to the serological changes he was able to demonstrate a distinct deterioration in ten of the children in the Müller-Singer group, which had taken place in the three years that had elapsed between their respective work. It is therefore apparent that a negative Wassermann reaction on the blood and spinal fluid is no longer the criterion for cessation of treatment, for the process may be clinically active and may yet lead to grave limitations, both physically and intellectually, in spite of treatment.

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DISCUSSION

DR. J. C. MCKINLEY, Minneapolis: Congenital syphilis, like that acquired in later life, touches on many fields of medicine. The neurologist, as a matter of course, is particularly interested in that group of congenital syphilitics who develop involvement of the nervous system. Since twenty to thirty per cent of luetic children are said to show evidences of one sort or another of neurosyphilis, it is apparent that careful neurologic studies in individual cases will be of considerable aid in solving the diagnostic and prognostic problems which these patients present. This is well shown by both of Dr. Whitmore's cases, in whom the physical signs of syphilis outside of the nervous systems were scarcely more than suggestive, but in whom the neurologic findings were of sufficient prominence, in conjunction with the case histories, to lead to an investigation of the spinal fluid and consequently to a definite diagnosis of syphilis of the nervous system.

Doctor Whitmore has enumerated the more common symptoms and signs of congenital neurosyphilis. His statement implies a fact that should be more generally recognized; that is, congenital neurosyphilis manifests itself in the same way, with minor variations, as adult acquired neurosyphilis. If, then, one has well in mind the various clinical pictures of acquired neurosyphilis, one should have no greater difficulty in the diagnosis and differential diagnosis among children than among adults.

The presence or absence of nervous system involvement in congenital lues in a given case is of more than academic interest. White and Veedor studied a series of 443 cases of hereditary syphilis. They concluded that the earlier treatment was instituted the better the prognosis, and that

where there were clinical or serological signs of affection of the central nervous system, the prognosis was much poorer, even with continuous well controlled therapy, than in those cases where there was no evidence of nervous system involvement.

DR. E. D. ANDERSON, Minneapolis: There are two points in this paper that it seems to me are of particular interest to the pediatrician. I think the general tendency has been for most of us to consider congenital syphilis as largely a physical rather than a nervous condition, but it has been shown in the literature that a very large percentage of the cases develop evidence of nervous syphilis. Jeans, of St. Louis, who has probably done as much work as anybody in this country on this subject, states that in individuals under two years old, having congenital syphilis, forty per cent of the cases show clinical or serological evidence of neurosyphilis, and in thirty per cent of older children with active syphilis, and in twenty per cent with latent syphilis, there is evidence of involvement of the nervous system. He shows that in a third of all congenitally syphilitic children we find evidence of nervous syphilis.

The other factor of interest was the illustration shown in this paper of how the treatment should be started early and not only started early, but carried on over a long enough period of time. Here are two children on whom a diagnosis of congenital syphilis was made within the first two weeks of life and if the treatment had been carried on long enough the result would have been better. I think most of us dread to see a case of congenital syphilis come to us because of the almost universal pessimism as to results that may be obtained. I think some of the work done in the last few years should lead us to believe that this pessimism is not always necessary.

Fordyce of New York, and Jeans of St. Louis, are two men who have probably done the most in this country on congenital syphilis. The reports of their investigations show that a great deal can be done for children if they are gotten early, but they emphasize again and again that treatment must be carried on over a long period of time. They both recommend the combined use of arsenic and mercury. They both favor giving the mercury intramuscularly. The salvarsan should be given either intravenously or intramuscularly. The salvarsan is given once a week, and the mercury treatment is not interrupted when they are giving salvarsan; in other words the two are carried on together.

Ordinarily from three to five doses of salvarsan are given, and then a rest period of four to six weeks, when it is repeated. The mercury is given continuously once or twice a week, unless evidences of kidney irritation occur. This combined treatment is carried on in infants at least a year, and in older children at least six months after all clinical and serological signs are absent. So I think that we should feel that congenital syphilis is not a hopeless proposition when treatment is properly carried on over a sufficient period of time.

DR. H. L. PARKER, Rochester: About two years ago I became interested in the subject of juvenile tabes and was able to gather seven patients in the records of the Mayo Clinic who have had this disease. There are, therefore, many points in Doctor Whitmore's paper that are of extreme interest to me. I have had the privilege of seeing

two patients who have been under more or less intensive treatment in the last two years and in whom the physical signs have remained more or less about the same.

There is one point, however, which is worth noting; that is, the fact that the course of the disease in juvenile tabes is very long and protracted. The patients bearing signs of juvenile tabes may not show any appreciable change in their condition for five, ten, fifteen or twenty years. On the other hand, it is possible that in some patients mental changes take place, whereupon the disease rapidly changes in appearance and progresses from that of a juvenile tabes to juvenile paresis. When once such a patient shows signs of paresis, an early termination of their life is to be expected.

Another point I would like to add and that is the difficulty of diagnosis of some of these cases. Dr. Whitmore has mentioned the fact and has laid stress on the importance of ocular findings. These findings, so far as my study went, were perhaps the most important in the diagnosis. The pupillary changes, with or without optic atrophy and perhaps a few other less marked clinical signs, are perhaps the most commonly found stigmata of the disease. Usually the patient presents very little for the purpose of diagnosis, and as has been pointed out the diagnosis is more often made by the ophthalmologist. Ataxia is relatively infrequent in juvenile tabes no matter how long the disease may have progressed. Finally, I would like to say that in the cases I had studied six had had spinal fluid examinations and in each the spinal fluid Wassermann test was negative. One of these three cases had, however, a cell count of 36 lymphocytes per cubic millimeter. It might be suggested that in those patients in whom the spinal fluid was negative there were few signs of progress in the disease over a period of years; it had come to a standstill.

DR. PAUL BERRISFORD, St. Paul: I was glad to have the opportunity of hearing Dr. Whitmore's paper. This rare condition was called to my attention during post-graduate study, in fact the two cases reported by Dr. Whitmore were first discovered during my work in the eye department of the St. Paul Dispensary.

It might appear out of place that an oculist discuss a neurological paper. Nevertheless, there is a more intimate anatomical association between diseases of the central nervous system and the eye than between the latter and the nose and throat.

From an ophthalmological standpoint I might mention a few points in juvenile tabes that are well worth emphasizing. Unlike adult tabes, juvenile tabes affects the female more frequently than the male, two-thirds of the cases ap-

pearing in girls. Ataxia is 50 per cent less frequent than in adult tabes. Optic atrophy is frequently the only sign in juvenile tabes. Statistics would tend to prove that the earlier the child is affected the more rapid is the progress of the optic atrophy. Fourteen per cent (Contonnet) of the cases of juvenile tabes have other evidences of hereditary syphilis, interstitial keratitis or chorio-retinitis atrophy.

The condition is due to hereditary syphilis, or syphilis acquired in early youth.

From a differential diagnostic standpoint juvenile tabes must be differentiated from, first, Friedreich's ataxia; second, hereditary cerebellar ataxia; third, cerebral lues; fourth, multiple neuritis. Friedreich's ataxia we recognize by the presence of ataxia, disturbances of speech, nystagmus and a family tendency. In hereditary cerebellar ataxia we not infrequently have an optic atrophy and immobility of the pupils, but there is also present ataxia and increased tendon reflexes. Much more difficult is it to differentiate juvenile tabes from cerebral lues, especially when the latter takes on the form of pseudo-tabes leuetica. However, just as in multiple neuritis, we do not find a progressive optic nerve atrophy. Serological and cytological examination is of much value. A positive Wassermann rules out Friedreich's ataxia, hereditary cerebellar ataxia and multiple neuritis.

DR. FRANK WHITMORE: Regarding the question of how much stress is to be placed on serology in children, it is a little bit difficult to answer. I really have not had very much experience with young children. In the literature Williams makes the point that not infrequently in babies, even if they have a distinctly positive syphilis, they may have both a negative Wassermann on the blood and a negative Wassermann on the spinal fluid. That same individual may, within three or five or eight months, develop a positive blood Wassermann and positive spinal fluid Wassermann. In my paper I tried to bring out the fact that a negative Wassermann due to treatment is not necessarily an indication of the cessation of the process. I think that is true and I am sure that in my cases my experience has shown that a negative cerebro-spinal fluid is not an indication that the process is at rest.

However, in a syphilitic individual, one that you know is syphilitic, spinal fluid changes must be looked on in the light of their present pathology or the pathology that may develop later, as Jeans pointed out; he calls it potential pathology. Those changes are increase in pressure, the globulin reaction, the Pandy reaction, and the mastic reaction—these tests indicate tissue changes. I think a great deal of emphasis should be laid on the serology in syphilis.

RUPTURE OF THE KIDNEY: CASE REPORT*

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The interesting factor in this case is the unusual way in which it occurred and the fact that what was apparently a trivial accident proved to be most serious and almost fatal.

B. G., a boy eight years of age, was referred to the Clinic on August 10, 1922, by Dr. E. W. Arnold, of Adrian, Minnesota. Patient walked into hospital and was at once put to bed.

He gave a history of having fallen five days before while climbing into a hayloft. In the fall he struck his abdomen on the top of the manger. He was a healthy stout boy of Hollander parentage and had never had any previous illness. He had been seen by another physician following the accident, but his condition then evidently was good as the parents were assured he was not seriously injured.

When admitted he had a pulse rate 132, respiration 30 and temperature 99.8°. The child was extremely nervous and had an anxious expression. On examination he was found to have a pronounced abdominal rigidity, tender all over and quite distended. He complained a great deal of pain, especially in the right lower quadrant of the abdomen. There was a leucocyte count of 15,000 while urinary findings were negative. A diagnosis of traumatic appendicitis was made and operation advised and accepted.

He was operated at 5:45 in the afternoon, two hours after having been admitted to the hospital. Ether anesthesia was used. A high right rectus incision was made. No free fluid was found in the abdomen, but there was a large mass subperitoneal under the liver appearing like a hematoma or an abscess. The appendix was located post-cecal and adherent to the posterior peritoneal wall over the region of the tumor mass which was about the level of the right kidney. The mass was very extensive, hard, and non-pulsating. The appendix, which was freed with great difficulty, was very congested and large with extravasated blood in the walls. It was ligated and removed. The stump was not invaginated owing to the difficulty of bringing up the cecum, but was treated, however, with carbolic acid and alcohol. A trochar was inserted in the mass

but no fluid escaped. On inserting the finger through the peritoneum it was found to be a dense clot and in this area a large portion of kidney tissue was found unattached. This measured about one and a half inches long in its largest diameter and was free from kidney capsule. A rubber tube drain was inserted and the abdomen closed in the usual manner. The operation lasted one hour and fifteen minutes.

The following day his dressing was found to be saturated with urine. The first four days in the hospital his condition was fair until the wound became infected and there was a very disagreeable discharge of urine and pus with separation of the edges of the wound and sloughing. On the seventh day, after consultation and ascertaining that the left kidney was functioning by a phthalein test, and owing to the fact that he would have a permanent urinary fistula, a nephrectomy was decided upon. The kidney was removed in the usual manner with a lumbar incision.

The boy had a very stormy convalescence. Owing to the fact that the entire wound became infected his recovery was slow and at times his life was almost despaired of. He left the hospital on the twenty-sixth day after the first operation and made a speedy recovery from then on.

I take the liberty of reporting this case because of the rather uncommon occurrence of kidney injuries and that the decision between expectant and operative treatment is a momentous one. On this decision the fate of the patient often rests. The treatment may be expectant or operative and Dr. F. S. Watson has reported a series treated expectantly with a mortality of 27 per cent, and another series treated by nephrectomy with a mortality of 22.5 per cent. Still another series of 107 cases were treated by gauze packing, drainage or suture with a mortality of 8.5 per cent. From the above figures it is plain to be seen that there is a school that favors the expectant treatment; another, early operative treatment as a necessary life-saving step.

It is only by a study of a large number of cases reported that one is able to judge the proper procedure. The need of such reports is brought out when we learn that Kusters says he made a report of 7,740 severe injuries, in only ten of which occurred injury of the kidney.

Israel in a large clinic in Berlin reports but one operative case. Judd reported ten injuries of the

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kidney, only eight of which were confirmed by operative procedure.

It has been noted that in the usual run of cases the first symptoms were severe and probably due to shock and hemorrhage; then there follows a short period of a few days when the patient's condition is somewhat improved; and later developing secondary grave symptoms due to infection, and nephrectomy is indicated.

Nielson says, "so-called expectant treatment is permissible only in cases where local symptoms are insignificant and constitutional ones are absent." All other cases are operative and must, of course, be a somewhat exploratory procedure, resulting in nephrectomy where the kidney is badly torn or suture can be substituted where the injury is not so great. Nielson and Watson have reported a few cases in which they made primary suture and they were able to locate a number of other case reports making a total of fourteen where the primary suture was satisfactory with the exception of two cases. In these two cases a nephrectomy was later required.

SUMMARY

1. While ruptured kidney is not an extremely frequent sequel of trauma to the abdomen it occurs in a sufficient number of cases to justify its careful consideration.

2. While the symptoms are generally grave at onset they may be mild enough to escape notice. Even urinary signs may be lacking.

3. Expectancy may have its place in treatment but in all except those showing a mild reaction operation with pack, suture, or nephrectomy seems the procedure of choice.

DISCUSSION

DR. GILBERT J. THOMAS, Minneapolis: The case that Dr. Watson reports is indeed very interesting and I wish to congratulate him on his report and the outcome of his case.

In 1917 I reported a case of spontaneous or non-traumatic rupture of the kidney. My conclusions were that a rupture in a pathological kidney may occur without trauma. Spontaneous rupture of the kidney probably does not occur without antecedent pathological change. There are many theories as to the cause of rupture from trauma. Some think that the rupture is brought about by the hydraulic pressure in the kidney. Others think that the distended kidney is thrown against the transverse process of the vertebra and ruptured. Another view is that the ribs are pressed into the distended kidney when external trauma is applied. There are many reports of rupture of the kidney secondary to chronic nephritis. These observations have been borne out by autopsy findings.

I recently observed a very interesting condition which is illustrated by a lantern slide. This patient was an old prostatic who had a tremendous amount of residual urine, which had dilated the kidney pelves and ureters. Because of interference with normal kidney function or lack of kidney tissue, this man was uremic and irresponsible. It was impossible to keep him in bed. On one occasion when the nurse was out of the ward, the patient got up and, because of weakness, fell, striking his abdomen and back on a table. Following this a quantity of blood was found in the urine, which continued until the patient died. The clinical cause of death was uremia. At autopsy the right kidney showed a diffuse hemorrhage in the adipose tissue along its anterior aspect. When the pelvis was opened, an area was found on the posterior wall about 3 by 2 cms. which was entirely denuded of mucosa. There was another tear in the mucosa on the posterior wall about 1 cm. in diameter. The left kidney did not show tears and there was no blood in the pelvis. The lantern slide shows the hemorrhage outside of the pelvis. This man did not have a fall of more than a few inches so that the trauma was very slight. This did, however, produce a hemorrhage and did rupture the kidney, although the kidney was partially destroyed by antecedent pathology.

Recently I observed a boy of 10 years who was forcibly thrown against a tree, striking on the right side of his back. He walked home, but that evening a quantity of blood was found in the urine. The physician who was called found a mass in the kidney area. There was no shock. Patient had little temperature and outside of moderate pain was apparently in good condition. The tumor increased in size during the next thirty-six hours and the patient's condition, except for the pain, was good. At times blood was found in the urine. At other times the urine was normal. The patient was carefully watched. At the end of a week the size of the tumor had decreased and continued to do so thereafter.

This is an illustration of injury of the kidney in which the capsule was ruptured. The tumor was caused by bleeding with the formation of a large clot. There was probably little or no urinary leakage. It is possible that the pelvis of the kidney was also injured, as the hematuria was severe.

DR. A. C. MCGEE, Deer River: In my experience I have had quite a number of cases of rupture of the kidney; but what I want to speak of in particular is that there are many of these cases that get well without surgical interference. It is usually characterized of course by the passing of blood in the urine, when the pelvis of the kidney is involved in the rupture, and there is a great escape of urine into the tissues of the lumbar region. But most of these cases will heal spontaneously. It is well, as the Doctor has outlined, when we have symptoms of severe shock and hemorrhage, to treat these cases expectantly.

Many of the cases that have come to me have been from the woods. In the early days we had the woods very close to us, and injuries to the kidneys were very common. Hardly a winter passed that we did not have a case of rupture of the kidneys. Of course many of them terminated in septic infection, and we had to remove the kidney. All I want to stress is that it is not every rupture of the kidney that needs surgical interference.

DR. F. W. METCALF, Fulda: I happened to be fortunate enough to be associated with Dr. Watson in the surgical treatment of this case that he reports. I just want to report an additional one of my own that will be quite a radical contrast to his. Dr. Watson's case had what appeared to be a very trivial injury, with very grave consequence to the kidney. The case that I wish to report was of a young man who sustained what seemed to be a very severe injury, being trampled upon by a horse.

The accident occurred about 6 o'clock. I was called out in the country to see him about 8 o'clock. He showed some abdominal reaction to the injury and a mild amount of blood in the urine. I felt that it was a traumatic kidney of a mild type—concussion resulting in slight bleeding. I saw him again about three hours later. On account of the abdominal pain and to rule out a possible rupture of the bowel with infection, we made a blood count and found that his leucocytes had shown a very rapid increase in the three hours. To be on the safe side operation was advised and accepted. Upon opening the abdomen I remembered a bit of advice from our old friend, Dr. Spalding: "When in doubt about whether a bowel has been ruptured, open the peritoneum under salt solution and watch for bubbles." We did this and no bubbles appeared. We felt that, with the abdomen open, exploration should be made on account of the severe symptoms. On examination we found nothing except a very small injury to the appendix, an area of softening on the side of the appendix about the size of an ordinary pea, which had almost perforated and which we considered was the cause of the rise in temperature and the increase in the leucocytosis. It appeared to be a case of partial and almost complete rupture of the appendix by hydraulic pressure. We felt that by the early operation we had saved the boy a very stormy time. The kidney lesion showed no signs of further difficulty, and after passing a slight amount of blood for a few days, he made an uneventful recovery.

DR. R. E. FARR, Minneapolis: I want to discuss just one feature of this subject, to add a word to what Dr. McGee has said with regard to conservatism. The last case of this kind that we had is a good illustration. The point I want to make is that even though we have a hemorrhage and later an infection from the leakage of urine into the loin, it is not always necessary to remove the kidney. In one case we removed about one-third of the kidney, which seemed to be loose and did not have a good blood supply. In the last case we simply sutured the kidney. It was ruptured across the midline of shortest diameter; and we simply sutured it with catgut and put in a drain. That boy made a very nice recovery, and he has remained perfectly well. Thus I believe if the portions of the kidney look healthy and are supplied by blood it is well to be conservative in these cases.

DR. O. W. PARKER, Ely: I have been very much interested in the paper and in these reports because at the present time we have a case that we are calling rupture of the kidney which we are treating conservatively, as mentioned by the essayist and Dr. McGee and others. This case was brought immediately to the hospital. He seemed to be severely injured and in shock. He had a large lump already formed in the right side over the kidney region. We immediately took an x-ray picture which showed a fracture of the twelfth rib on the right side and a fracture of the ilium, curling it over. Blood immediately appeared in the urine, almost pure blood at the first specimen. But the boy rallied so promptly—he had been hit by a large piece of iron in construction work—that we felt like treating him conservatively and have continued to do so, hoping that we will not have to interfere. He is improving at the present time. The blood has practically disappeared from the urine—a few cells at times. His temperature has remained low; and he has had no chills. Everything is pointing toward a recovery. We are treating him conservatively with the hope that we will get by without surgery.

A SURVEY OF THE MIDWIFE SITUATION IN MINNESOTA*

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The total number of licensed midwives in Minnesota is 118. It has been felt for a number of years, both by the State Board of Medical Examiners and by the State Board of Health, that this number did not actually represent the entire number of women practising midwifery. It has been the hope of both these organizations for some time to make a survey of the state so that a more accurate conception might be had of the number, qualifications and practice of the midwives of the state than was afforded by the list of known and licensed midwives and by the study of the birth records. Lack of means prevented any such study being made until quite recently. The formation, in the summer of 1922, of a Division of Child Hygiene in the State Board of Health provided a program and a budget for just such studies as this, closely related, as it is, to the field of maternity and infancy. A survey of the midwife situation in Minnesota was therefore made during the past summer.

During the course of the survey almost all of the counties of the state were visited; certainly no section of the state was overlooked. A visit was made to all licensed midwives and as many others as could be located. Names and addresses of unlicensed midwives were obtained from birth certificates and from information furnished by physicians, other midwives, and interested citizens. In some instances the names and addresses of licensed midwives were found to be incorrect—the person named in some cases being deceased or in others having moved elsewhere anywhere from one to five years previously. Almost all midwives interviewed were agreeably obliging to the purpose of the interviewers, regardless of whether or not the midwife was properly licensed. Most of them showed some curiosity as to the purpose of the visit, but all were satisfied with the explanation that the state must require the same data regarding the status of those

practising midwifery as it does of those practising medicine or dentistry.

Vital statistics reviewed in this survey were compiled from birth and death certificates over the period. These figures are exclusive of the cities of Minneapolis, St. Paul, and Duluth, which were so exhaustively studied in the recent paper of Drs. F. L. Adair and C. O. Maland. No distinction has been made between births occurring in hospitals and those occurring outside. In the opinion of Mrs. G. C. Pierson, Director of the Division of Vital Statistics for the State Board of Health, no such distinction could accurately be made for the period covered with the figures now available. Such figures from the three largest cities may be accepted, but from elsewhere throughout the state the reporting of births—accurately—has been too exceptional to permit conclusions to be drawn on this point. Two years ago our Vital Statistics Law was amended and a section added providing that all hospitals and institutions in the state make monthly reports to the State Board of Health. The Director of the Division of Vital Statistics says: "However, we did not insist upon such reports at the time as it was not possible for us to check them when received. In November of 1922, however, a clerk was furnished for this purpose and we immediately requested all hospitals to send in a record of all births and deaths which had occurred in the institution during 1921 and 1922. These reports, when checked against the original certificates, revealed that although the birth record was on file it did not contain the name of the hospital. Since November of 1922 monthly reports have been received from hospitals and we have inserted the name of the latter on each original certificate when the latter did not contain its name. This should mean that in the future figures compiled from the original records should be authentic as to the number of births which occurred in hospitals."

TABLE I
TOTAL NUMBER OF LICENSED AND UNLICENSED MID-WIVES
BY COUNTIES

County	—Mid-wives—		
	Licensed	Unlicensed	Total
Aitkin	0	0	0
Anoka	0	0	0
Becker	1	0	1
Beltrami	1	0	1
Benton	0	1	1
Big Stone	1	0	1
Blue Earth	0	0	0

*Presented before the annual meeting of the Minnesota State Medical Association, St. Paul, October, 1923.

Brown	0	1	1	Sherburne	0	0	0
Carlton	1	1	2	Sibley	0	0	0
Carver	1	0	1	Stearns	5	6	11
Cass	0	0	0	Steele	0	0	0
Chippewa	0	0	0	Stevens	0	1	1
Chisago	2	2	4	Swift	0	1	1
Clay	0	4	4	Todd	0	0	0
Clearwater	0	0	0	Traverse	0	0	0
Cook	0	0	0	Wabasha	0	0	0
Cottonwood	2	0	2	Wadena	0	0	0
Crow Wing	0	1	1	Waseca	1	0	1
Dakota	3	0	3	Washington	1	0	1
Dodge	0	0	0	Watonwan	0	0	0
Douglas	0	2	2	Wilkin	0	0	0
Faribault	0	0	0	Winona	3	0	3
Fillmore	2	0	2	Wright	1	0	1
Freeborn	0	1	1	Yellow Medicine	0	0	0
Goodhue	4	0	4		—	—	—
Grant	0	0	0	Total for state.....	118	48	166
Hennepin	31	3	34				
Houston	1	0	1				
Hubbard	0	0	0				
Isanti	1	0	1				
Itasca	0	3	3				
Jackson	0	0	0				
Kanabec	2	0	2				
Kandiyohi	1	0	1				
Kittson	0	0	0				
Koochiching	1	0	1				
Lac qui Parle	0	0	0				
Lake	0	0	0				
Le Sueur	0	0	0				
Lincoln	0	0	0				
Lyon	0	0	0				
McLeod	0	0	0				
Mahnomen	0	0	0				
Marshall	1	0	1				
Martin	0	0	0				
Meeker	0	4	4				
Mille Lacs	2	0	2				
Morrison	1	1	2				
Mower	0	0	0				
Murray	0	0	0				
Nicollet	0	0	0				
Nobles	0	0	0				
Norman	1	0	1				
Olmsted	0	0	0				
Ottertail	1	4	5				
Pennington	0	0	0				
Pine	3	2	5				
Pipestone	0	0	0				
Polk	0	0	0				
Pope	0	0	0				
Ramsey	33	1	34				
Red Lake	0	0	0				
Redwood	1	0	1				
Renville	1	0	1				
Rice	0	0	0				
Rock	0	0	0				
Roseau	0	0	0				
St. Louis	7	9	16				
Scott	1	0	1				

NOTE: Since this survey was made, six additional unlicensed midwives have been found, making the total midwives for the state 172.

TABLE II
RELATION BETWEEN THE NUMBER OF MID-WIVES AND THE CHARACTER OF THE POPULATION

County	—Population—		No. of Midwives	Mid-wives per 100,000 Population
	% Native	% Foreign Born		
Aitkin	77.1	22.1	0	0
Anoka	79.3	20.4	0	0
Becker	75.3	17.3	1	4.3
Beltrami	74.3	19.7	1	3.7
Benton	83.3	16.6	1	7.1
Big Stone	83.9	16.0	1	10.0
Blue Earth	86.7	13.3	0	0
Brown	82.5	17.5	1	4.5
Carlton	68.0	29.8	2	10.0
Carver	86.8	13.2	1	5.9
Cass	80.4	13.0	0	0
Chippewa	82.9	17.1	0	0
Chisago	73.5	26.3	4	27.7
Clay	80.9	19.0	4	18.7
Clearwater	74.0	21.8	0	0
Cook	57.6	31.5	0	0
Cottonwood	83.0	17.0	2	13.7
Crow Wing	79.6	20.3	1	4.1
Dakota	80.0	19.9	3	10.4
Dodge	88.1	11.8	0	0
Douglas	79.3	20.6	2	10.5
Faribault	87.8	12.1	0	0
Fillmore	88.5	11.5	2	7.9
Freeborn	83.8	16.1	1	4.0
Goodhue	82.3	17.4	4	13.0
Grant	82.6	17.4	0	0
Hennepin	76.3	22.7	34	8.2
Houston	87.5	12.5	1	7.1
Hubbard	85.6	14.3	0	0
Isanti	72.5	27.4	1	7.5
Itasca	71.3	26.8	3	12.0

Jackson	83.9	16.1	0	0	Washington	80.0	19.8	1	4.2
Kanabec	77.5	22.5	2	22.0	Watonwan	83.2	16.8	0	0
Kandiyohi	78.3	21.6	1	4.5	Wilkin	86.5	13.5	0	0
Kittson	70.8	29.1	0	0	Winona	86.0	14.0	3	3.9
Koochiching	68.4	30.7	1	7.4	Wright	82.9	17.1	1	3.5
Lac qui Parle	82.0	18.0	0	0	Yellow Medicine ..	82.6	17.0	0	0
Lake	60.7	38.2	0	0					
Le Sueur	86.8	13.1	0	0	Entire state	78.9	20.4	166	6.95
Lincoln	80.4	19.6	0	0					
Lyon	83.0	16.9	0	0					
McLeod	83.2	16.8	0	0					
Mahnomen	67.3	10.1	0	0					
Marshall	75.3	24.7	1	5.1					
Martin	87.1	12.9	0	0					
Meeker	81.2	18.2	4	22.1					
Mille Lacs	77.2	20.8	2	14.1					
Morrison	81.0	19.0	2	7.7					
Mower	87.8	12.1	0	0					
Murray	83.7	16.3	0	0					
Nicollet	82.8	17.0	0	0					
Nobles	85.2	14.8	0	0					
Norman	80.0	20.0	1	6.7					
Olmsted	88.9	10.9	0	0					
Otertail	79.3	20.5	5	9.8					
Pennington	78.9	21.0	0	0					
Pine	75.5	23.5	5	23.6					
Pipestone	83.8	16.0	0	0					
Polk	78.5	21.5	0	0					
Pope	81.6	18.4	0	0					
Ramsey	76.7	21.9	34	13.9					
Red Lake	81.9	18.0	0	0					
Redwood	85.2	13.9	1	4.8					
Renville	83.6	16.4	1	4.2					
Rice	86.9	13.0	0	0					
Rock	80.5	19.4	0	0					
Roseau	74.9	25.0	0	0					
St. Louis	64.9	34.6	16	7.7					
Scott	87.2	12.7	1	7.0					
Sherburne	83.5	16.3	0	0					
Sibley	85.7	14.3	0	0					
Stearns	87.3	12.6	11	19.7					
Steele	84.6	15.3	0	0					
Stevens	85.7	14.3	1	10.0					
Swift	83.7	16.3	1	6.6					
Todd	85.3	14.7	0	0					
Traverse	84.7	15.3	0	0					
Wabasha	87.3	12.7	0	0					
Wadena	83.4	16.6	0	0					
Waseca	88.0	12.0	1	7.1					

TABLE III

NATIONALITY OF MID-WIVES INTERVIEWED

Birthplace	No.	Per cent
*America	16	13.7
Austria	9	7.7
Australia	1	0.85
Bohemia	2	1.71
Denmark	1	0.85
Finland	11	9.4
Germany	20	17.1
Hungary	2	1.71
Luxemburg	2	1.71
Norway	15	12.8
Poland	12	10.2
Russia	1	0.85
Sweden	15	12.8
Slavonia	7	5.99
Switzerland	2	1.71
Syria	1	0.85

Total number—117.

* Includes one negro.

Native—16, or 13.7%.

Foreign—101, or 86.3%.

TABLE IV

AGE GROUPS OF MID-WIVES INTERVIEWED

				Number of mid-wives fifty years old or over—				Per Cent	
				Licensed	72			63.73	
				Unlicensed	18			15.93	
					—	90	—	—	76.66
				Number of mid-wives less than fifty years old—					
				Licensed	20			17.69	
				Unlicensed	3			2.65	
					—	23	—	—	20.34
				Grand total	113			100.00	

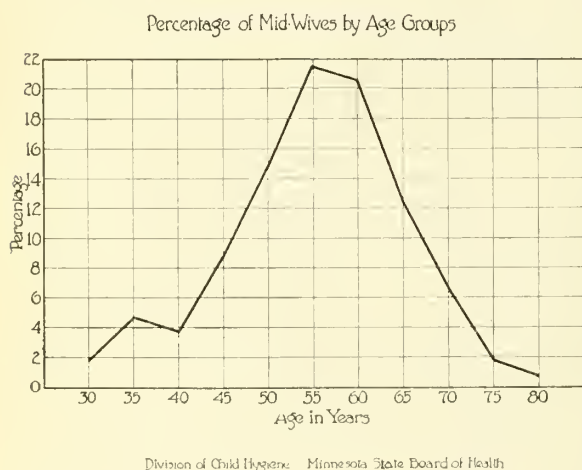
TABLE V

TRAINING OF MID-WIVES INTERVIEWED

	Six Months or more in School for Mid-wives		Less than Six Months in School for Mid-wives		Practical Ex- perience with a Mid-wife or Doctor		Correspon- dence Course in Mid-wifery		No Training	
	No.	%	No.	%	No.	%	No.	%	No.	%
Licensed mid-wives	48	46.1	16	15.3	21	20.2	2	1.9	1	0.95
Unlicensed mid-wives	2	1.9	0	0.0	8	7.7	0	0.0	6	5.7
Total	50	48.0	16	15.3	29	27.9	2	1.9	7	6.65

Table No. I: This chart shows that approximately 28 per cent of the midwives found and interviewed in the state are without license. This does not take into consideration the occasional, neighborhood midwife of whose activities considerable evidence was found in certain portions of the state. An accurate estimate of the number of this type of midwife and an appraisal of the scope and nature of her activities is beyond the resources of such a survey as this. For example, in the counties of Cook, Lake, and Kittson, in the northern part of the state, no midwives were found, yet an examination of the birth certificates from these counties shows that 30 per cent of the births in those counties are attended by midwives.

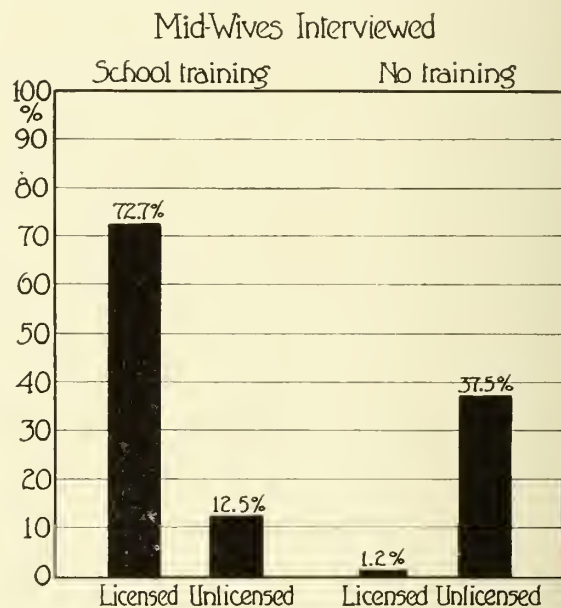
In Table No. II it was hoped that a definite relationship between the number of midwives and the percentage of native and foreign born population in a given county would appear. Apparently, however, no such relationship exists, although its apparent absence may be due to the presence of an unknown number of that group of so-called occasional midwives mentioned above. Such a conclu-



sion is born out by Table VIII and its accompanying graph. Here the curve showing the natural increase in the percentage of native-born mothers is practically paralleled by the curve of physician-attended births. On the other hand, the decrease in the number of foreign-born mothers is roughly matched by a decrease in the number of midwife-attended births and by a decrease in the number of births reported by "others" which, in many cases, probably means midwives.

Tables III, IV, and V are a consideration of certain characteristics of midwives as individuals.

Table No. III shows the birthplace of the midwives interviewed, with only 13.7 per cent native born. Table No. IV shows one of the most distinct characteristics of the midwives of the state as a group. Practically 80 per cent of them are over 50 years of age. There is a tendency, of course, for only women of mature years to begin practising midwifery, but this does not entirely explain the situa-



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tion, since the majority of the midwives interviewed began their practice at between 30 and 40 years of age. In interviewing a considerable number of midwives, one cannot help getting the impression that midwives in Minnesota as a group are disappearing, simply because they are not being replaced. The midwives themselves seem distinctly and somewhat sadly conscious of this tendency.

Table V indicates that slightly more than 90 per cent of the midwives interviewed have had a more or less definite training in midwifery. Many of these took their training in a certain St. Paul school of midwives which has long since ceased to exist. The chart also shows the difference in training between the licensed and unlicensed midwives: of the licensed midwives 72.7 per cent had training in a school for midwives, while of those unlicensed only 12.5 per cent had an equivalent training. At the other extreme—of the midwives without training only 1.2 per cent were licensed, while 37.5 per cent were unlicensed.

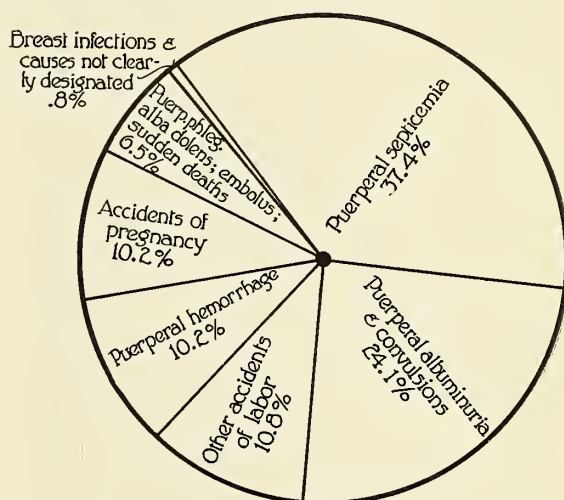
TABLE VI
NUMBER OF CASES ATTENDED PER YEAR BY MID-WIVES
INTERVIEWED

No. of Mid-wives	No. of Cases per Year	Per cent of Mid-wives per Group	Grades		
			A	B	C
37	0 — 9	32.17	0	1	36
19	10 — 19	16.52	0	2	17
13	20 — 29	11.31	0	0	13
12	30 — 39	10.43	0	0	12
13	40 — 49	11.31	1	0	12
3	50 — 59	2.61	0	0	3
7	60 — 69	6.08	1	1	5
1	70 — 79	0.86	0	1	0
2	80 — 99	1.75	0	0	2
8	100 and over	6.96	1	0	7
115		100.00	3	5	107

In Table VI the amount of work done by individual midwives is indicated. This chart also indicates a rather arbitrary grading of the midwives based upon the evidence furnished in the interviews. Roughly, the grading indicates as follows: Grade A indicates an alert and intelligent woman who answered questions accurately and promptly, who gave evidence of understanding the proper technique of normal delivery, the recognition of obstetrical complications and particularly an understanding of her limitations. They also showed by their personal appearance and their home conditions a high degree of neatness, cleanliness and orderliness. Grade B includes those who failed in one or two respects from qualifying as belonging to group A. The great majority fell into Class C, which includes all those failing to show a proper understanding of the meaning of asepsis, or of the conduct of a normal delivery, and particularly those who apparently had no proper conception of their limitations in the presence of obstetrical com-

plications or who failed to show a basis upon which they would be able to recognize such complications. This group, likewise, includes all of those showing evidences of senility, who were slow and rambling in the answering of questions, or who showed evidences of carelessness and untidiness in the care of their persons or surroundings. It was thought in preparing this chart that a definite relationship might be shown between the grading of a particular midwife and the size of her practice. Thus it was found that only eight midwives of those interviewed

Maternal Deaths in Minnesota*
1918-1922



* Not including Minneapolis, St. Paul & Duluth

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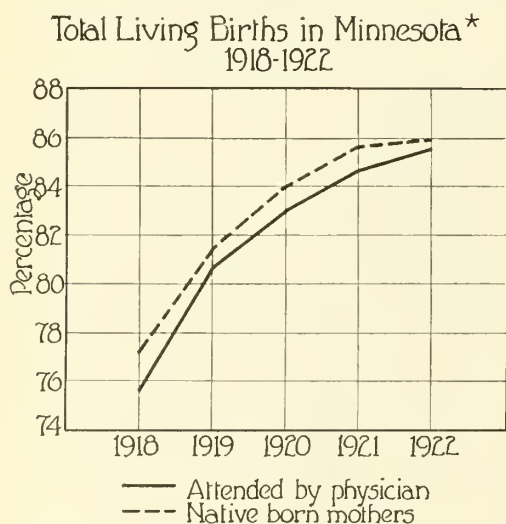
had more than one hundred cases a year, and when it was found that eight midwives fell into grades A or B it was thought at first that these probably

TABLE VII
MATERNAL DEATHS OVER FIVE-YEAR PERIOD 1918-1922 IN
MINNESOTA EXCLUSIVE OF MINNEAPOLIS, ST. PAUL
AND DULUTH
DEATH CLASSIFICATION NUMBER

Year	134	%	135	%	136	%	137	%	138	%	139	%	140	%	141	%
1918.....	13	7.6	20	11.8	15	8.8	63	37.1	45	26.5	14	8.2	0	0	0	0
1919.....	29	15.9	16	8.8	19	10.4	57	31.4	45	24.7	16	8.8	0	0	0	0
1920.....	20	8.8	23	10.1	29	12.7	93	40.8	52	22.8	11	4.8	0	0	0	0
1921.....	15	8.1	19	10.3	14	7.6	84	45.6	39	21.3	12	6.6	0	0	1	0.5
1922.....	19	10.6	19	10.6	25	14.0	56	31.3	50	28.0	9	5.1	1	0.6	0	0
Totals	96		97		102		353		231		62		1		1	

represented the same group. When the chart was finally completed, however, it was seen that only one of this group of eight midwives fell into either grade A or B, the remaining seven being class C midwives. It is a question as to just what inference one would be justified in making from this situation.

Table VII shows the maternal deaths over a five-year period. The graph indicates clearly where the emphasis needs to be placed in any campaign for the lowering of the maternal mortality rate.



*Not including Minneapolis, St. Paul & Duluth

Division of Child Hygiene Minnesota State Board of Health

LEGAL REQUIREMENTS FOR LICENSE General Statutes 1913

4983. *Midwifery licenses.*—A person desiring to practice midwifery in the state, if not already authorized so to do, shall apply to the state board of medical examiners for a license. Such license shall be granted upon the production of a diploma from a school of midwifery recognized by the board, or after examination of the applicant, upon the consent of seven members thereof. Examinations shall be held concurrently with those provided for applicants for physicians' licenses. The fee for a license granted on diploma shall be one dollar, and on examination two dollars. (2302.)

4984. *Renewal, revocation, and refusal.*—All licenses to practice midwifery, heretofore or hereafter issued by the board, must be annually renewed, and a fee of one dollar be paid for each renewal. Licenses may be revoked or renewals thereof refused by the board for unprofessional or dishonorable conduct, or neglect to make proper returns to health officers of births, deaths, puerperal fever, and other contagious diseases. (2303.)

CONCLUSIONS

1. The number of midwives in Minnesota is small. A total of 166 were found, of which 113 were licensed.

2. The number of midwives is decreasing, as shown by (a) the age groups, and (b) by the absolute and relative number of cases attended by them.

3. The amount of work done by midwives varies with the character of the population. It gradually falls off as the proportion of native-born mothers increases.

4. Most midwives are foreign-born; they are a foreign importation not thriving well in this country.

5. Of the midwives interviewed 28 per cent were without license; of the "occasional" midwife probably none is licensed. There is no apparent difference in quality between the work done by the licensed and that done by the unlicensed midwives.

6. Practically all unlicensed midwives are located outside the three large cities. In rural districts, apparently the unlicensed midwife is not interfered with because of her failure to secure a license.

TABLE VIII

TOTAL LIVING BIRTHS IN STATE OUTSIDE OF MINNEAPOLIS,
ST. PAUL AND DULUTH, ATTENDED BY:

Year	M. D.	%	Mid.	%	Other	%
1918.....	31,188	75.9	3,954	9.7	5,883	14.4
1919.....	29,630	80.5	2,333	6.3	4,838	13.2
1920.....	32,950	83.0	2,612	6.6	4,126	10.4
1921.....	33,857	84.8	2,293	5.7	3,799	9.5
1922.....	33,554	85.4	2,210	5.6	3,519	9.0

Total 5 yrs. 161,179 13,402 22,165

NATIVITY OF MOTHERS

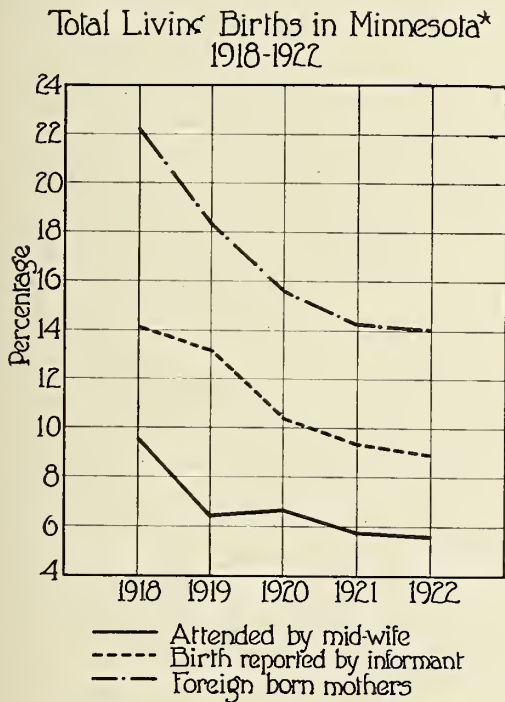
	Foreign	%	Native	%	Total Mothers
1918.....	7,774	22.8	26,436	77.2	34,210
1919.....	6,986	18.6	30,667	81.4	37,653
1920.....	6,327	16.0	33,121	84.0	39,448
1921.....	6,043	14.5	35,543	85.5	41,586
1922.....	5,838	14.3	34,651	85.7	40,489
Total 5 yrs.	32,968		160,418		193,386

DISCUSSION

DR. F. L. ADAIR, Minneapolis: I am sure we are all very glad to have heard this careful analysis of the mid-wife situation in Minnesota, and I am sure something should be done if possible to eliminate the casual mid-wife, and the Grade C mid-wives. I noticed something of interest in reference to Dr. Boynton's figures, to which I wish to call attention. In considering the number of cases which the different mid-wives handled, there were only eight mid-wives

of Classes A and B, and while only one of these had over a hundred cases, a ratio of 1 to 7; it is noticeable that in the other less qualified group there were in all 107 mid-wives, seven of whom had over a hundred cases a year, which is a ratio of about 1 to 15. Evidently, if figured on this basis the mid-wives of Classes A and B have a better chance of getting more practice than do those in the C group.

The main part of my discussion will be to supplement Dr. Boynton's study by some tabulations which Dr. Maland and I made regarding the midwifery situation in Minneapolis and St. Paul particularly. The first one is a tabulation of the total living births in Minneapolis and the place where the birth took place and the character of the individual who delivered, that is I mean the scientific character, whether physician or mid-wife. In Minneapolis and St. Paul in the last ten-year period there has been a very marked increase in the number of hospital deliveries. It is very peculiar that the percentage is practically the same in the two cities. In both cities the percentage of hospital deliveries in 1913 was a little over twenty per cent. In 1922 the percentage of hospital deliveries had risen to over sixty per cent, approximately 64 and 65 per cent.



* Not including Minneapolis, St. Paul & Duluth

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Not counting the hospital deliveries, but simply figuring on the basis of home deliveries, there has been in Minneapolis during this period of time an increase in the percentage of deliveries done by physicians, though there has been a decrease in the actual number, due to the increased number of deliveries done in the hospital. In St. Paul the condition is not quite the same. There has been an actual

decrease in the number of deliveries in the home by both physicians and mid-wives; but there has been a percentage increase in the number of deliveries by mid-wives. Really the difference in the statistics in the two cities shows that while there has been both an actual and a percentage decrease in the total number of home deliveries done by mid-wives in both St. Paul and Minneapolis, in ratio the deliveries done by physicians as compared with mid-wives has increased in Minneapolis, but decreased in St. Paul.

These are the main points that will be brought out by the tables and the graphs which I shall show on the screen. The factors in the production of the increase in the number of hospital deliveries are difficult to determine. There are probably many factors which contribute to this. One factor has undoubtedly been the increased emphasis placed on prenatal care and maternal welfare.

DR. J. C. LITZENBERG, Minneapolis: I do not know that I can add anything to illumine this subject. There are two or three satisfactory things that I have noted in both of these reports. I had the privilege of reading them both before coming here. Dr. Adair and Dr. Boynton had sent them to me. On the surface it would seem that the mid-wife situation in Minnesota will probably take care of itself in time; that it will be reduced to an inconsiderable number. However, we should not lessen our efforts to bring about the desired result of getting the number of women delivered by mid-wives down to zero.

I am unable to analyze the increased hospitalization as a part of an obstetric problem; but it seems to me that is probably a part of that general tendency to increased hospitalization of cases, which the Secretary of the American Medical Association spoke of last night. That there was too much hospitalization—that certainly does not apply to obstetrics yet. I feel very much gratified that this work is being carried on under the bureau which as you know has been established for the purpose of getting at what the situation is. The work of Dr. Adair and Dr. Boynton has given us considerable information on the mid-wife; and we see it is not dangerous. It is a problem but not a dangerous problem in this state, because it is on the decrease. It is not like it is in some other states.

I think that perhaps an analysis of birth deaths and maternal deaths with mid-wives and physicians in a further study may be rather illuminating. I remember in most of the references which I have had occasion to look up from time to time in this mid-wife problem that two or three investigators have started out with the idea of an investigation to prove that maternal deaths and infant deaths were due to the prevalence of the mid-wife. There was one very illuminating paper by Dr. Williams of Johns Hopkins, who was asked to study this question. His discoveries were such that he turned his paper into a scathing arraignment of the medical profession, because he found in the investigations that the percentage of maternal and infant deaths was very much greater in the practice of physicians than of mid-wives. I hope that further investigation in Minnesota will not substantiate that thing.

The profession of the state of Minnesota is to be congratulated for the fundamental work on these investigations. Of course there are other problems which this bureau is to take up from time to time which will give us something

definite to take up. I do not feel much alarmed about the mid-wife problem here, but I am considerably concerned about the obstetrics practiced by the medical profession.

DR. H. B. ZIMMERMAN, Saint Paul: I would like to ask Dr. Boynton in her final discussion if she thinks—I meant to ask Dr. Litzenberg—that there is a field for properly educated mid-wives and properly trained mid-wives today.

DR. RUTH BOYNTON, Minneapolis: I do not know, but it might be well to let Dr. Litzenberg or Dr. Adair—who have had a great deal more experience—answer that question about the field for properly trained mid-wives. Apparently in sections where there is a large foreign-born population, they have their place. The question is, it seems to me, whether or not there are enough physicians to take care of the obstetrical work in these localities. I think that is especially true in this state in the northern counties where the population is sparse and the distances which have to be traveled by the physicians are so great that they really are unable to take care of the work.

There is just one other thing that I would like to speak of, and that is these births which are reported by others, that is, reported by informants. We noted that there were about twice as many births reported by informants as births reported by mid-wives; it is the opinion of Mrs. Pierson, the Director of the Division of Vital Statistics, that a certain percentage—probably a large percentage—of births that are reported by informants are probably handled not by licensed mid-wives but rather by these so-called occasional mid-wives. It is hoped that we can find some means of determining just exactly what percentage of these births really are attended by mid-wives.

DR. F. L. ADAIR, Minneapolis: To answer Dr. Zimmerman's question, I would say that personally I feel there is no place for the mid-wife in the cities. I think that by proper co-operation between physicians and nursing organizations the mid-wife can be dispensed with very effectively for the benefit of the community. As Dr. Boynton suggested, in sparsely settled communities, rural communities, I still think that mid-wives may have a place and perhaps will for many years to come. But certainly the Grade C and the casual mid-wife should be absolutely eliminated. Grade A and Grade B mid-wives might be relatively safe institutions, but the untrained casual mid-wife and the poorly equipped Grade C mid-wife are a menace to humanity. There can be no question about that in the mind of any one who seriously considers that problem.

DR. J. C. LITZENBERG, Minneapolis: Are there any schools of mid-wifery any more?

DR. RUTH BOYNTON, Minneapolis: I do not think there are many schools at the present time. Most of the mid-wives whom we interviewed had their training in foreign countries. Those who had their training here, as was mentioned in the paper, had gone to this school for mid-wives in Saint Paul; and then a few had attended schools for mid-wives in Chicago; one or two in the schools for mid-wives in Milwaukee. I believe those schools are not running at the present time. There is a school for mid-wives in New York City in connection with Bellevue Hospital. I believe.

A CASE OF ACUTE OSTEOMYELITIS OF THE MANDIBLE

HAROLD E. HULLSIEK, M.D.

Miller Hospital Clinic
St. Paul

Osteomyelitis of the jaw has probably decreased in the inverse ratio to our increase in interest regarding general health, oral hygiene and industrial sanitation. With increased precautions regarding use of toxic agents in the industries comes a decrease in the number of cases of phosphorus necrosis. Early diagnosis and treatment of tuberculosis, typhoid, lues and other conditions which predispose to osteomyelitis have caused a rapid diminution in the number of cases. The substitution of amorphous phosphorus for yellow phosphorus in the match industry has aided materially. The smaller doses and better controlled administration of mercury has done a great deal to eliminate gingivitis and a subsequent osteomyelitis from that cause. The importance of dental care has become well recognized and thus the predisposing factor of carious teeth is not the menace it was in earlier times.

This condition occurs at all ages, depending on the underlying cause, not any particular age being liable. Osteomyelitis of a definite bacterial origin, however, is more prevalent in childhood and adolescence. There are a variety of causes, which may be grouped as follows:

1. Secondary to infectious conditions about the teeth and peridental tissues.
2. By direct extension from suppurative conditions of the soft tissues about the jaws.
3. Toxic agents such as phosphorus, mercury, pearl dust, et cetera.
4. Secondary to the acute infectious diseases.
5. Secondary to osteomyelitis in any other part of the body.
6. Following trauma.

Necrosis of the lower jaw occurs oftener than that of the upper jaw because of the very much more dense bone in the lower and also because of the difference in the blood supply. The superior maxilla has a very rich blood supply with vessels which anastomose freely, while the lower jaw has but two, which sometimes do not even connect with one another. The bacterial form in the lower jaw may be either hematogenous or extend directly from the periosteum through an open wound. In

either case the vessels in the bone subsequently become thrombosed or constricted, shutting off the blood supply to that particular area and causing localized tissue death. If the infection is from the medulla of the bone with a localized abscess in the bone with no outlet, there is more or less of a severe reaction with chills, high temperature and marked pain. On the other hand, if it extends through the cortex so that there is immediately an outlet or if there is an outlet through an old tooth socket the symptoms are not so marked. The destruction of the bone goes on after the abscess has formed and the pocket is either opened and drained artificially or it continues to extend until it involves the entire body of the mandible, and attempts to drain itself either through the tooth sockets or by burrowing its way through the cortex. If these pockets are discovered and drained early extensive involvement of the bone may be prevented. When drainage has been accomplished either artificially or otherwise the severity of the symptoms gradually subsides, the character of the pus changes from that of a thick purulent material to a thin watery discharge much less in volume. New bone is gradually laid down and the dead portions are separated off and become sequestra. The mandible has a tremendous power of regeneration and the entire bone may be developed following the removal of a sequestrum.

Treatment in the acute stages consists of hot, moist dressings, continuously, to increase the circulation and promote localization. Great care must be given to the hygiene of the mouth inasmuch as persons suffering from this condition usually have a marked edema of the jaws and inside of the mouth preventing proper mastication and salivation and coincident cleansing of the oral cavity. Mouth washes should be used very frequently and the mouth swabbed out with applicators containing an antiseptic. Due to the swelling there is very often inability to take food, and, in order to combat the severe toxemia which is sometimes present, fluid should be administered by rectum. Incision of fluctuating areas should be done as rapidly as they are discovered, the incision being made inside of the mouth or outside, depending upon the shortest route to the pus, but inside of the mouth whenever possible, to obviate disfiguring scars. When the swelling begins to subside and the discharge to lessen in volume, probing through the incisions or into the tooth sockets, if the teeth have been extracted, will disclose the presence of carious bone.

This should be treated with extreme conservatism and removed only when completely separated. The fragments will usually show themselves through the drainage openings in the mouth and can be withdrawn quite easily, depending, of course, upon their size. Large fragments will sometimes exist, necessitating enlarging the drainage openings; a cast of the entire lower jaw has been removed in one piece. The removal of the sequestra sometimes extends over several months and cannot be hastened. In milder cases the teeth need not be sacrificed, but when one has made himself reasonably sure that they will tighten up again they may be allowed to remain.



Fig. 1. Radiograph taken November 2, showing no evidence of osteomyelitis.

If they become so loosened in their sockets that there is no question of their being sacrificed they should be withdrawn, as this promotes additional drainage openings and prevents collection of septic material about their roots.

The case which I wish to report was seen by me on October 25, 1923. He is a boy 18 years old, in good health, whose past history is negative. Four

days before reporting to me he engaged in a football game. At that time he received a blow upon the chin, with a slight abrasion. He remembers that while going home from the football game he picked at this abrasion on his chin, with his finger

could not completely close his mouth. The temperature ranged from 100 to 104 during this time. On cleaning out his mouth on October 29th it was thought there was some pus seen exuding from one of the tooth sockets on the right side. A forceps was inserted along the tooth and down to reach into a pocket which extended along the entire right side of the mandible. The forceps was spread and about 2 ounces of pus evacuated with free drainage following this procedure. This cavity was cleaned out daily, the entire mouth toiletted and the cavity irrigated out with Dakin solution several times a day. In the ensuing ten days several more such cavities were found and opened inside the mouth. The teeth at that time were quite loose and the ad-



Fig. 2. Radiograph taken November 27, four weeks after entrance to hospital, showing definite osteomyelitis involving entire mandible.

nail. The next day he had a small red spot on his chin. The following day this was somewhat tender and swollen. When I first saw him he had an area on the point of his chin about the size of a fifty cent piece, red, shiny, swollen and very tender. The glands were swollen under the chin and tender. The entire chin was slightly edematous. His temperature by mouth at that time was 102.8, his pulse 88. I tried to impress upon him the danger of infections about the mouth and nose and sent him to the hospital, where he was put to bed and had continuous hot applications applied to the whole lower half of his face and chin. He grew progressively worse until on October 29th swelling had extended down on to his neck, up to and including the ears, upon his face until his eyes were closed and he



Fig. 3. Same as Figure 2, showing opposite side of mandible.

visibility of extracting them was considered but the patient and his family were quite insistent that this should not be done and that they were sure they would tighten up later on, so the extraction was delayed.

At this time the boy was very toxic, his urine showing albumin and casts; he was unable to swal-

low and was given fluids by rectum continuously. For a week he was delirious most of the time. On November 2nd he was x-rayed and the plate showed a destruction of bone substance around the roots of the lower central incisor and bicuspids. The x-ray diagnosis was peridental-infection with no evidence of osteomyelitis. The same day he was taken to the operating room and two incisions made below the chin in the endeavor to get better drainage from the aforementioned pockets. About this time the swelling began to decrease, he became less toxic and by November 6th his temperature had gradually become normal. He was now taking liquids by mouth and was able to gargle and wash out his own mouth. The urine, which had contained albumin and casts, was now clear. By November 14th he was up in a chair and walking about and on Novem-

with the jaw again acutely inflamed. It was more swollen than when he left the hospital, he was having a great deal of pain and the discharge was increased. He was sent back to the hospital with axillary temperature of 100 and a pulse of 96. The



Fig. 4. Radiograph taken December 19, showing increased bone destruction with loss of teeth.

ber 16th he insisted on going home and was discharged on a protest, with his jaw still somewhat swollen and discharging moderate amount of pus, his temperature 99 and pulse of 80.

On November 25th he was again seen at home



Fig. 5. Radiograph taken March 19, showing a return to normal in horizontal position of bone.

teeth were all very loose at this time, drainage was re-established with a prompt subsiding of symptoms. On November 27th an x-ray was taken which showed a diffuse osteomyelitis of the entire mandible. By December 4th the symptoms had again subsided and although he had a great deal of swelling and some discharge he was allowed to go home.

On December 6th I was called to his home and he was found to be having a moderate amount of oozing from around one of his molar teeth on the right side. He was taken to the hospital in the middle of the night. This tooth was picked out with an ordinary forceps and a profuse hemorrhage immediately occurred from the socket. This socket was packed and the hemorrhage controlled with a great deal of difficulty and he remained free from bleeding during the night and until the following

afternoon, when he began to bleed more than ever. He was taken to the operating room and all his lower teeth were extracted and the sockets sutured together with one suture of plain catgut across the middle of each socket. At this time three or four pieces of bone were removed, one about an inch long. There was no bleeding following this procedure and only a very slight discharge. The swelling gradually subsided and he was allowed to go home on December 14th with a practically normal temperature.

He was seen in the office on January 1st, at which time he had gained back fifteen of the twenty-five pounds that he had lost and had gone back to work. He still has a moderate amount of swelling, but is no longer toxic and his color has improved a great deal. He is eating very well—of course he is embarrassed to a certain extent by his inability to

take very solid food. At this time three or four more pieces were removed through the mouth.

He was again seen on January 11th and four small fragments of bone removed. He was seen twice during February, each time a small fragment being removed. On March 1st another large fragment was withdrawn and one was seen protruding from the opposite side. This latter one, however, was not sufficiently loosened to come away easily and was left until a later date.

He will be seen from time to time and the sequestra removed as indicated and subsequently we hope to have him in such condition that a lower plate may be applied and he can again enjoy life as before.

At the present date, March 20, 1924, fifteen fragments of bone have been removed, varying in size from one-half to four centimeters long.

MINNESOTA MEDICINE

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VOL. VII

JUNE, 1924

No. 6

EDITORIAL

Rehabilitation in Minnesota

The federal government has done and is doing much for those disabled as a result of their service in the World War. Until recent years little has been done or thought necessary for the immense army of civilians incapacitated by accident or disease. That their rehabilitation is a paying proposition, to say nothing of its humanitarian side, has only recently been proven.

It will be a matter of news to most of our readers that Minnesota was among the pioneers in this rehabilitation activity. In July, 1919, rehabilitation work was begun in Minnesota and those active in the work were called upon to take part in the forming of the Federal Industrial Rehabilitation Act which was passed in June, 1920. Minnesota was one of the few states already organized and ready to avail itself of the federal appropriation authorized by this Act.

The federal Act is another so-called "grant-in-aid" measure and makes available a certain sum to any state which will undertake rehabilitation activities. The federal measure is very broad in its scope and includes residents and citizens of the United States incapacitated by accident or disease.

Our state measure limits its activities to citizens and residents of the state but federal funds are available for the assistance of outsiders.

As the activities provided for are educational primarily a Division of Rehabilitation under the State Department of Education was formed with headquarters at the State Capitol. Provision has been made for expenses incidental to re-education and administration only. No allowance is provided for living expenses of those availing themselves of the provisions of the act so that various local charitable and civic organizations are often called upon for assistance. The revolving fund established by the Knights Templars is available in this connection. The Rehabilitation Division provides re-educational facilities in educational or industrial institutions compensating those providing the training. A staff is maintained for the investigation, advisement and placement of applicants. Often the student continues as an employe after the period of training is completed. Difficulty was encountered in placement of students on account of the reluctance of employers to employ individuals with physical handicaps, fearing an increase in the insurance rate for their employes. This difficulty has been largely overcome by state legislation enacted in 1919, making such rate increases by risk carriers a misdemeanor.

During the last fiscal year which ended July 1, 1923, 178 cases were closed as rehabilitated, 29 of whom were women. Of the 361 cases in the live roll at the end of the year, 58 were women. During the year some 236 new cases were registered. The division cost during the year about \$47,000.00 and the estimated income of those rehabilitated amounted to \$160,000.00.

There are those who object to what they term the socialistic tendencies of the day. The above figures confirm the opinion that this sort of work pays. Physicians especially are in a position to appreciate the need of assistance to individuals who are incapacitated from continuing their previous vocations on account of disease or accident. No one who has not become thus disabled can appreciate the agony of spirit experienced by one who is forced by circumstance to look forward to a future of financial helplessness and dependence. The physician more than anyone else is in a position to assist such individuals by putting them in touch with this newly established Division of Rehabilitation, which will help them to help themselves.

Statesmanship

A medical journal is no place for politics but statesmanship is a subject quite distinct from politics. The trend of affairs at Washington, which is calling forth so much adverse criticism, leads us to express ourselves on the subject.

There are certain issues to the settlement of which it is of vital importance that Congress should direct its best endeavors. This nation has recently emerged from a world conflict which has left the rest of the civilized world in a deplorable condition through the loss of hundreds of thousands of its best men. Our loss on this score was comparatively insignificant and even our financial expenditure, tremendous as it was, has not been serious. What steps have been taken to prevent future international embroilment which may be disastrous? The present difficulty with Japan shows the need of some international medium for settling questions involving international relations.

The public is two to one against a soldier bonus as shown very definitely by the poll conducted by the Literary Digest. Have our representatives in congress carried out the wishes of their constituents by passing the bonus bill? Is the passage of a bonus bill going to aid in the reduction of federal taxation which is the crying need in this country?

We have no constructive measures to offer. That is not our business. It is the business of Congress. And yet perhaps we expect too much of our national legislature composed as it is of doctors, lawyers, merchants, thieves, et al. As former Vice-President Marshall so aptly put it in a recent local address—when we are sick we call a physician, when in financial difficulty we retain the smartest lawyer we can find, but we send to our legislatures men in most instances honest but whose only qualifications as law-makers is their citizenship.

The blame descends for the most part on our own heads in that only a fraction of the voters of the country exercise their franchise. Class distinctions are becoming more and more evident in the selection of legislators so that class affiliation rather than personal ability determines elections.

The outstanding need today in our government is statesmanship. We need representatives and, alas, senators particularly who will legislate wisely and not keep their ears to the ground to detect the trend of factional and class interests. It is high time that statesmanship were reorganized as a profession and means for such professional training provided.

Wanted—statesmen to exercise wisdom in the administration of state, national and international affairs.

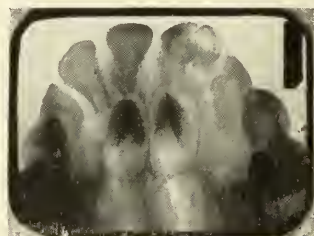
COMMUNICATIONS

81 East Madison St.,
Chicago, May 19, 1924.

TO THE EDITOR:

On December 6th, 1923, I read, by invitation, a paper on Cleft Palate before the Minneapolis Surgical Society.

In my illustrations, shown during the lecture, I exhibited a number of pictures showing union established between the maxillary and premaxillary bones. But in the discussion, Dr. Waldron said: "I would like to ask Dr. Brophy one question with reference to bony union. Those of you who have read some of Dr. Ritchie's articles on this subject—and we are sorry that he is not here tonight because we would like to have him present his ideas on the question of preliminary lip closure—Dr. Ritchie says he has yet to see evidence of bony union as shown by the x-ray. I would like to ask Dr. Brophy if he has made any systematic record post-operatively, that is, three or four years after operation, of the presence of bony union by the use of dental films and careful x-ray studies."



Case 1. Fig. 1. X-ray photograph of palate of child of about two years showing perfect union of premaxillary with maxillary bones. All deciduous teeth are in place, though not all fully erupted; permanent central incisors shown in formation.

I had no x-ray pictures with me in Minneapolis to show union of the bones, but I have had hundreds of patients for whom such union has been secured, and others in Chicago and elsewhere have been operating and securing union of these bones most satisfactorily.

In order that I may settle this question in the minds of those who have not seen union in such cases, I am sending to you for publication in your journal, x-ray pictures and photographs of plaster casts of the mouth of a child, taken at the age of a little more than two years. The bone operation, moving into position the protruding premaxilla and uniting them to the maxilla, was done when the child was about three months old; the lip was not done until more than 18 months later because the parents could not come to the hospital; and the soft palate is yet to be closed.

In these illustrations, perfect union of bone is clearly

shown; and a well defined arch with teeth in correct position. All of the deciduous teeth are shown, but some of them are not fully erupted. Two permanent central incisor teeth are in formation and shown in the x-ray. The occlu-

the vomer, move the premaxillæ back and make no attempt to unite them to the maxillæ is unsurgical, cannot produce a normal arch and may be likened to the treatment of a fracture elsewhere without insuring contact of freshened surfaces and immobilization. It is well known that such treatment would result in non-union.

To establish union between the premaxillæ and the maxillæ, such procedure as I have advised must be followed. Those who do not follow this practice will meet with failure—and it is following such failure, I am sure, that Dr. Ritchie's observations have been made.

I have no other motive in this matter than to assist in making known a very important technic in establishing normality of the separated and misplaced bones.

Very truly and fraternally yours,

TRUMAN W. BROPHY.

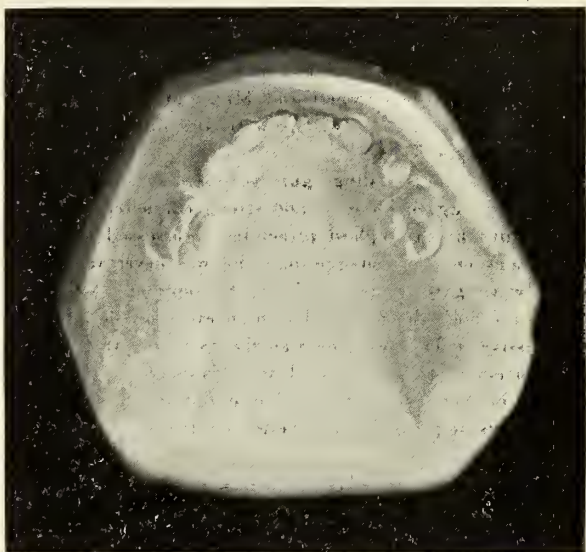


Case I. Fig. 2. Cast of upper arch, showing teeth in normal position. The first molars and cuspids are not completely erupted. This case shows the value of retaining the tuberosities in normal position, leaving the soft parts only slightly separated and the palate, when united, long enough to close the naso-pharyngeal opening.

sion is good, as will be seen. It will also be seen that the tuberosities are in normal position. The cleft of the soft palate is, consequently, very narrow and abundantly long so when united it will easily close the naso-pharyngeal opening.

I have just returned from California and this is my first opportunity to address you on this subject. However, these illustrations can be duplicated many times from patients of mine and of other surgeons who follow a course of treatment such as I have outlined in this and other papers.

I am satisfied that those who have not seen cases where perfect union has been established between the premaxillary and the maxillary bones, have seen cases which were not properly operated. I wish to reiterate what I said in my Minneapolis paper: The premaxillæ should be moved into place after freshening the surfaces which are to come into contact. The compact bone should be removed and the freshened surfaces of cancellated bone placed in contact and immobilized. When this is done, the soft tissues covering the bones may be sutured with horsehair. To divide



Case I. Fig. 3. Cast of mandible. Shows well formed arch, with eight deciduous teeth erupted.



Case I. Fig. 4. Upper and lower arches in normal occlusion, though molars and cuspids not fully erupted.

OBITUARY

DR. JOHN LANDENBERGER

Dr. John Landenberger died at his home in New Prague, Minnesota, May 13, 1924, of an apoplectic stroke.

Born in Alton, Illinois, September 23, 1850, John Landenberger came to New Prague with his parents when a boy. He was graduated from Bennett Medical College, Chicago, and practiced medicine at New Prague from the time of his graduation in 1875 to the time of his death.

Dr. Landenberger was a member of his county and state medical societies and one of the delegates to the State Association at the time of his death. He was the first president of the Scott-Carver County Medical Society, for which he was always a zealous worker. He was a member of the N. P. Lodge No. 46 I. O. O. F., King Hiram Lodge No. 31, A. F. and A. M. of Jordan, and of the A. O. U. W.

Dr. Landenberger is survived by his widow, two daughters, Mrs. M. C. Campion and Mrs. Carl Fiske, and two sisters, Mrs. Hattie Lampert and Mrs. Catherine Canaries.

The following tribute was paid to Dr. Landenberger in the New Prague Times:

"He was an outstanding figure possessed of a vivid, virile personality, rugged honesty, and strong character. He was ever guided by the highest principles. Possessed of strong convictions on all moot questions, he was never vacillating but always gave voice openly to his opinions. He was always a force to be reckoned with on every public question. Progressive in his views, he was always in the vanguard of any movement tending toward the advancement or betterment of his home community. The life of Dr. Landenberger has left its impress for the better on the history of New Prague."

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

NORTHERN MINNESOTA MEDICAL ASSOCIATION

Monday and Tuesday, August 4 and 5, 1924, have been chosen as the dates for the annual meeting to be held in Duluth. Among the out-of-town speakers who will appear on the program are: Dr. Williard Bartlett, St. Louis; Drs. W. J. Mayo and L. G. Rowntree, Rochester; Dr. C. N. Candler, Fargo; Dr. Theo. Bratrud, Warren; and Dr. C. B. Lewis, St. Cloud.

The annual banquet will be held Monday evening. Plans are also being made for golfing and excursions, either by boat or automobile to Isle Royale, Port Arthur, or the iron range.

Dr. E. L. Tuohy, of Duluth, is chairman of the committee on arrangements for the Duluth meeting. The program committee is headed by Dr. W. W. Will, Duluth.

NORTHWESTERN MEDICAL OFFICERS ASSOCIATION

At the meeting of the Northwestern Medical Officers' Association held May 6, 1924, in Minneapolis, opportunity was afforded those attending to gather together and recount

war experiences. Following the dinner the meeting was addressed by Mayor Leach, of Minneapolis.

The following officers for the ensuing year were elected: Dr. E. M. Jones, St. Paul, president; Colonel C. S. Lister, of the dental department of the U. S. P. H. S., Minneapolis, vice-president; Dr. E. M. Hammes, St. Paul, secretary-treasurer.

MINNESOTA PATHOLOGICAL SOCIETY

"Modern Research in an Effort to Explain the Mechanism of Life" was the subject of the presidential address given by Dr. H. B. Sweetser, Minneapolis, at the annual meeting of the Minnesota Pathological Society, Tuesday evening, May 20, at the Institute of Anatomy, University of Minnesota. Officers elected for the coming year were: President, Dr. E. L. Gardner, Minneapolis; vice-president, Dr. William O'Brien, Minneapolis; secretary-treasurer, Dr. E. T. Bell, Minneapolis.

OF GENERAL INTEREST

Dr. Owen W. Parker was elected president of the Ely Rotary Club at its recent annual meeting.

The first group of students of the Central School of Nursing, University of Minnesota, was graduated March 31, 1924.

Dr. and Mrs. J. A. Evert, of St. Anthony Park, Saint Paul, have returned from a month's trip to New York City and Boston.

Announcement has been received of the marriage of Miss Blanche MacCarthy to Dr. J. C. Michael, of Minneapolis, which took place in Minneapolis, May 17.

Miss Newcombe, Assistant Superintendent of Nurses, Miller Hospital, Saint Paul, has resigned to accept a position as Superintendent of Nurses, St. Luke's Hospital, Duluth.

Dr. John D. Camp, formerly of the Mayo Clinic, Rochester, is now associated with the Massachusetts General Hospital in Boston as a member of the staff of the x-ray department.

Dr. and Mrs. H. G. Franzen, Minneapolis, who have spent the past two months in Los Angeles, Hollywood and other points in California, returned recently by way of Lake Louise and Banff.

The many friends of Dr. Henry Mason Wheeler, of Grand Forks, N. D., will be interested to learn of the arrival of Henry Mason Wheeler, Jr., in April. This news is of particular interest in that Dr. Wheeler has already reached the age of three score years and ten.

Thirty nurses were graduated from St. Mary's Hospital Training School for Nurses, Minneapolis, Monday evening, May 19. Diplomas and medals were presented by Rev. J. H. Gaughan, assisted by Dr. M. J. Lynch. Dr. H. B. Sweetser, chief of staff of St. Mary's Hospital, and Right Rev. J. M. Cleary addressed the graduates.

Monday, May 12, 1924, National Hospital Day, was observed at Mounds Park Sanitarium by the dedication of a bronze tablet presented by the Alumnae of the Mounds School of Nursing, in memory of Miss Esther Kirbach and Miss Anna Dahlby, two graduates of the school, who gave their lives in service to their country during the war.

Work was begun the first of this month on the Red Wing hospital, which will be practically a new institution. An entirely new main structure is to be built to replace the old wooden building, which is to be converted into a nurses' home. The new building was made possible through a gift of \$35,000.00 from Miss Helen Friedrich and C. E. Friedrich, of Red Wing.

Work on the University of Minnesota stadium has been under way for about two months and the contractors expect to have it finished by October 1, so that all home football games can be played on the new field. The contract calls for its completion not later than October 25, a week before the Minnesota-Michigan game, at which the Memorial Stadium will be dedicated to the Minnesota students who have lost their lives fighting for their country.

Announcement is made of a prize essay competition on the subject of "The Interrelationships of Hospital and Community" by the Modern Hospital Publishing Company, of Chicago. Three cash prizes of \$350, \$150 and \$100 will be awarded, and there will be such honorable mentions as may be authorized by the Committee of Awards. Those interested may obtain further information by addressing the Modern Hospital Publishing Company, 22 East Ontario Street, Chicago.

Women internes will be employed at the Minneapolis General Hospital in accordance with a resolution adopted by the Public Welfare Board at a recent meeting that "women's applications shall be placed on exactly the same basis as men, and that the selection of internes shall be so governed." Dr. Mabel Ulrich, who has been a staunch advocate of this policy for the past five years, was in England at the time the vote was taken which brought about the adoption of the policy for which she has worked.

The sixteenth annual commencement exercises of the Mounds School of Nursing conducted by the Northwestern Baptist Hospital Association in connection with Mounds Park Sanitarium, Midway Hospital, and Merriam Park Hospital was held Friday evening, May 16, at the First Baptist Church, St. Paul. Dr. Charles R. Ball, member of the school faculty, and Rev. S. P. Shaw, Sioux Falls, S. D., were the commencement speakers. Diplomas were conferred upon the graduates by Dr. George Earl, president of the Association.

In honor of Dr. George Henry Simmons, for twenty-five years editor of the Journal of the American Medical Association, who has asked that he be retired in his seventy-third year, a banquet will be given Monday, June 9, 1924, at the Congress Hotel in Chicago. Members of the medical profession, educators, scientists and other friends will gather at the banquet to express their appreciation of the outstanding service Dr. Simmons has rendered to medical literature, to medical education, to medical organization, to science, and to the general public welfare.

In connection with Minneapolis Clinic Week, there was held a meeting of secretaries of the various county medical societies. A substantial number of secretaries attended the meeting and an informal discussion of county society affairs took place. Dr. A. E. Benjamin, of Minneapolis, described in some detail the newspaper publicity campaign sponsored by the Hennepin County Medical Society which is about to be instituted. After some discussion it was determined in-

advisable to resurrect the organization composed of county secretaries which has been defunct for several years.

The faculty of the New York Polyclinic Medical School and Hospital, in appreciation of the needs of the general practitioner, has organized a six weeks' course of co-ordinated, intensive, full time instruction, in an endeavor to cover in a comprehensive way the essential points in diagnosis and treatment, in conformity with the present status of general medicine, surgery, and the specialties. The object of this course is to assist the general practitioner in acquiring a practical knowledge of the more recent advances made in medicine and surgery. The present course covers the period between May 19 to June 28, 1924. Information as to date of subsequent courses may be had upon application to the Superintendent. A fee of \$150.00 is being charged for the course.

Minneapolis Clinic Week, May 6-9, 1924, attracted some 130 physicians from without the Twin Cities. The clinics offered were admittedly up to standard but the attendance was below that of previous years. This can be accounted for by the stringent financial situation particularly felt outside of the larger cities and partly by the fact that numerous medical meetings happened to come in May and June this year.

The Minneapolis Health Exposition held in connection with the Clinic Week and sponsored by the Hennepin County Medical Society was an interesting feature. The exposition was put on in a big way and the variety of displays was striking. Mr. Logsdon and a staff of workers carried out the details of the exposition in a most creditable manner and the displays put on by the A. M. A., Minnesota State Board of Health and the University were remarkable. The local physicians furnished their services in connection with the free health examinations which were conducted to acquaint the public with what a medical examination consists of. While local opinion differs somewhat as to the advisability of such expositions, the good in certain lines accomplished by this particular exposition was undeniable.

The Entertainment Committee of the Hennepin County Medical Society conducted during the past winter, a bridge tournament in the society rooms in the Donaldson Building. A series of six matches, one each month, was held. A home to home match was held with Olmsted County, the result being an even score. About sixty members participated with an average attendance of thirty. The members reported some very enjoyable evenings and are looking forward to the series of 1924-1925.

A number of choice prizes amounting to something over \$350.00 were donated by the following firms:

C. Bagstad, Surgical Supplies,

Dezeng Ophthalmoscope and Otoscope.

Donaldson Pharmacy,

Game set in mahogany case.

Noyes Bros. & Cutler,

Baumanometer.

Charles Anderson, Surgical Supplies,

Silver cup.

Physicians Exchange,

Year membership.

Physicians and Hospital Supply Co.,

Set of two Thermos bottles in case.

Syndicate Building Pharmacy.

One hundred cigars.

A. Kneibel Cigar Store.

Fifty cigars.

Benson Optical Company.

Automobile goggles.

Loop Garage.

\$10.00 in trade.

G. Dauphine Tire Co.,

Three \$6.00 purchase certificates.

In addition to these donations prizes amounting to \$70.00 were purchased. The tournament the coming season will be under the chairmanship of Dr. C. A. Boreen, who states that members are now willing to challenge any group in the state.

Under the management of this committee a very successful golf tournament was held last season. Plans are nearly complete for the 1924 tournament and a much larger number have signified their intention to play. Two matches have already been arranged with the Olmstead County Society, two with the Ramsey County Society, and two with the Minneapolis District Dental Society. Several more are being started. All members of the profession in Minneapolis are invited to enter this tournament.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association:

ABBOTT LABORATORIES:

Procaine-Epinephrine Ampules, 1 c.c. (Abbott).

ARMOUR AND COMPANY:

Anterior Pituitary Tablets, 2 grains (Armour).

Pituitary Tablets, 2 grains (Armour).

Parathyroid Tablets, 1/10 grain (Armour).

LEHN AND FINK:

Sagrotan.

ELI LILLY AND COMPANY:

Uletin (Insulin-Lilly), U-40.

A. LUMIERE LABORATORIES:

Cryogenine.

MALLINCKRODT CHEMICAL WORKS:

Neoarsphenamine-Mallinckrodt, 0.15 gm. Ampules.

Neoarsphenamine-Mallinckrodt, 0.3 gm. Ampules.

Neoarsphenamine-Mallinckrodt, 0.45 gm. Ampules.

Neoarsphenamine-Mallinckrodt, 0.6 gm. Ampules.

Neoarsphenamine-Mallinckrodt, 0.75 gm. Ampules.

Neoarsphenamine-Mallinckrodt, 0.9 gm. Ampules.

Neoarsphenamine-Mallinckrodt, 1.5 gm. Ampules.

PARKE, DAVIS AND COMPANY:

Pituitrin "S" (Surgical).

Ampules Pituitrin "S" (Surgical), 1 c.c.

WELTY COMPANY:

Deodorized Kerosene-Welty.

WILSON LABORATORIES:

Desiccated Parathyroid Substance-Wilson.

Tablets Desiccated Parathyroid Substance-Wilson, 1/20 grain.

Tablets Desiccated Parathyroid Substance-Wilson, 1/10 grain.

NEW AND NON-OFFICIAL REMEDIES

Cod Liver Oil-Squibb.—It has a content of fat soluble vitamin-A which is more than one hundred times that of best quality butter. For a discussion of the actions and uses of cod liver oil, see Useful Drugs. The average dose is 15 c.c. E. R. Squibb and Sons, New York. (Journal A. M. A., April 5, 1924, p. 1123.)

Sagrotan.—A liquid composed of chlorocresol 8 per cent, chlorxylenol 4 per cent, soap 22 per cent, alcohol 9 per cent, and water 57 per cent. Sagrotan is an antiseptic and germicide. The germicidal efficiency of sagrotan is stated to be 2.5 times that of an equal quantity of phenol. While the germicidal efficiency of sagrotan is almost equal to that of compound solution of Cresol U.S.P., it has the advantage over this preparation in that it is almost odorless; also, it is claimed to be less toxic. Lehn and Fink, New York.

Procaine-Epinephrine Ampules, 1 c.c.—Procaine-Abbott. 0.02 gm., epinephrine 0.00004 gm. in Ringer solution, 1 c.c. The Abbott Laboratories, Chicago. (Jour. A. M. A., April 12, 1924, p. 1199.)

Deodorized Kerosene-Welty.—Kerosene which has been treated so as to remove the odorous constituents of commercial kerosene. Because of its solvent action on fats, deodorized kerosene-Welty is proposed for use as a pediculocide and as a means of removing dandruff and the detritus of wounds. Welty Company, Chicago.

Anterior Pituitary Tablets-Armour, 2 grains.—Each tablet contains desiccated pituitary substance (anterior lobe)-Armour (see New and Non-official Remedies, 1924, p. 226), 2 grains. Armour and Company, Chicago.

Pituitary Tablets-Armour, 2 grains.—Each tablet contains desiccated pituitary body-Armour (see New and Non-official Remedies, 1924, p. 226), 2 grains. Armour and Company, Chicago.

Parathyroid Tablets-Armour, 1/10 grain.—Each tablet contains desiccated parathyroid gland-Armour (see New and Non-official Remedies, 1924, p. 224), 1/10 grain. Armour and Company, Chicago.

Pituitrin "S" (Surgical).—A slightly acid aqueous extract of the posterior lobe of the pituitary body of cattle, approximately six times the strength of Solution of Hypophysis U. S. P., containing 0.5 per cent of chlorbutanol as preservative. For a discussion of the actions and uses of pituitary preparations, see Pituitary Gland, New and Non-official Remedies, 1924, p. 225. The preparation is supplied in the form of ampules pituitrin "S" (surgical), 1 c.c. Parke, Davis and Company, Detroit. (Journal A. M. A., April 19, 1924, p. 1265.)

PROPAGANDA FOR REFORM

Matamel.—The statement of composition of Matamel which appears in the advertising of the Newton Laboratories is practically the same as that claimed for Agmel at the time. While Agmel was said to be obtained from the sap of *Agave americana*, Matamel is stated to be derived from another species of *Agave*, namely, *Agave atrovirens* Karw. An analysis of Agmel made for the Council on Pharmacy and Chemistry in 1912 showed the preparation to be a kind of molasses containing a small quantity of formic acid. No alkaloids were found, nor more than a trace of protein matter. At that time the opinion was expressed that the therapeutic value of Agmel was probably nil. (Journal A. M. A., April 5, 1924, p. 1139.)

J. Bernard King's Radium Fraud.—For some years one J. Bernard King has been defrauding the public by selling earth as a cure for all the ills of the flesh under the claim that it was a radium salt. A quietus has been put on King's scheme through the issuance of a fraud order debaring him from the use of the United States mails, not only under his own name, but under the name of the "International Radium Company" and "Radium Products Company." King called his product "Ray-Cura" and claimed that it consisted of radium sulphate found "in the mountains of North America." Ray-Cura was marketed in cloth covered pads which were composed of little sacks of a light colored substance of the consistency of flour. The alleged curative power existed in what Mr. King called radium emanations from this substance. The government investigation brought out that the contents of a pad which sold for fifteen dollars, cost less than six cents. The product was found not even to be radioactive and gave forth no radium emanation. (*Journal A. M. A.*, April 12, 1924, p. 1215.)

Tolysin Omitted from N. N. R.—Tolysin is the proprietary name under which the Calco Chemical Company markets its brand of neocinchophen. The Council on Pharmacy and Chemistry agreed to recognize this proprietary name, first, because the Calco Chemical Company promised to use novatophan (under which name the drug was introduced) or neocinchophen (the New and Non-official Remedies' name) as a synonym, thus avoiding, in a measure, confusion concerning the identity of the substance on the part of physicians, and second, because at that time, the firm was the only manufacturer of neocinchophen in the United States. Before Tolysin was accepted the Council required the discontinuance of the claim that the drug is free from cardiac depressant and renal-irritant action, except when limited amounts are used. Despite this requirement, advertising recently issued for Tolysin implies that it is free from toxicity. Further, the Calco Chemical Company determined to break its agreement to use neocinchophen or novatophan as a synonym. The council has omitted Tolysin from New and Non-official Remedies because (1) it is marketed with unwarranted therapeutic claims, and (2) by the omission of the established synonym, neocinchophen (or novatophan), the physician is likely not to appreciate the character of the drug and its relation to cinchophen. (*Journal A. M. A.*, April 26, 1924, p. 1381.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of April 9, 1924

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, April 9, 1924, at 8 P. M. The meeting was called to order by the President, Dr. Hamilton. There were 43 members and two visitors present.

The minutes of the March meeting were read and approved.

The following members reported cases:

1. DR. JOHN FULTON (St. Paul) reported a case of Beginning Panophthalmitis Due to Trauma Successfully Treated by Milk Used as a Foreign Protein.

Mr. W. W. T. was assaulted August 5th by being hit a blow with the fist on left eye, driving a piece of the glasses

he was wearing into the eye, severely injuring the cornea, cutting it horizontally through the center down to the limbus on both sides.

I saw him early on the morning of the 6th. The eye-balls and lids were badly inflamed but pupil easily dilated with atropin so that I could get a clear view of the fundus. The evening of that day I was called to his house to see him again and found a very severe septic inflammation starting in; lids and bulbar conjunctiva edematous and many small hemorrhages showing themselves in the conjunctiva. He suffered great pain in the eye throughout the night. He came to the office the following morning with all of the above symptoms increased. The pupil no longer responded to atropin. Edges of the corneal wound white with septic matter. Pus in anterior chamber. All the structures of the eye were badly inflamed. A typical picture of commencing panophthalmitis.

Dr. Paul Berrisford saw the case with me in consultation. He quickly recognized the gravity of the eye condition and strongly urged the milk protein treatment.

The patient was immediately sent to St. Luke's Hospital. On the afternoon of that day he was given 6 c.c. of milk boiled for four minutes; this by the intermuscular route. This produced no constitutional reaction.

The next day Dr. Carl Larsen examined the case with me, and he strongly endorsed the treatment but advised an increase of the dosage, which was pushed up to 12 c.c. with the most gratifying results. Patient's temperature went up to 101. The pupil began to dilate and the intense tenderness of the eyeball, which had been caused by the rapid onset of the septic iridio-cyclitis, had almost completely disappeared.

The intermuscular injections of boiled milk were kept up for several days longer until the eye became quiet, the inflammatory effusion became absorbed, and the eye was soon restored to the condition that it was in before it was injured.

My object in reporting this case to this Society instead of to the Academy of Ophthalmology is to open up the question as to whether or not this same treatment will benefit similar inflammatory conditions in other parts of the body.

Gratifying results from parenteral protein therapy can be abundantly found in the reviews of our medical journals. One of the most interesting reports is from De Andrade, of Rio de Janeiro, in which he reports the most gratifying results in treating postoperative iridio-cyclitis and three cases of gonococcus in which he obtained prompt and complete relief of this most dangerous disease. One of his cases was suffering from urethritis and an old suppurative otitis media, both of which promptly healed under the influence of some therapeutic remedy. He never used more than eight injections and never witnessed any unfortunate effects.

Many foreign proteins are now most popular remedies in the treatment of septic diseases, but milk seems to be the most important, reliable and marvelous in its effect, according to a careful survey of very extensive literature from reliable sources. Schmidt, of Prague, although having had experience with other proteins, in 1815 selected cow's milk for this purpose, assigning for the reason that it was always available, its chemical composition was constant, whereas the composition of the artificial proteins and their derivatives are subject to considerable variation.

There is no doubt as to its wonderful efficiency in acute iritis, iridocyclitis and gonorrheal conjunctivitis. For the former, it quickly relieves the pain and breaks up the synechia which resists atropin. This agent is a powerful prophylactic and for this purpose is being used by many surgeons, with the object of reducing the chances of infection. Many members of my own specialty use it as a preventive in those cases of cataract operation where they have reason to fear septic complications and to aid in relieving septic conditions which still, though very rarely, take place after cataract operations.

Discussion: DR. BROWN: I have used some of these milk injections myself and they do work well in some cases and not in others, and I have been striving to find something that could be standardized better. Dr. Boeckman, I believe, started these injections in St. Paul. Dr. Boeckman got certified milk at first and the injections were very unsatisfactory, so he went down to one of the restaurants and got some of their milk and he then had some very good results.

You are introducing a foreign protein into the system, and that is the thing which turns the case and that keeps these toxins from developing. While milk has done a great deal in these cases, I do not see how it is going to be standardized. Some work is being done on other substances. If we could get another foreign protein which is in the nature of some standardized substance like the vaccine proteins which we introduce for typhoid, and available to everybody in standardized form, I think it would be a fine thing. I think that we are working along the right direction, and that something of that sort will be evolved eventually. There is no question but what the foreign protein turns the tide for the patient and a great many eyes are saved in that way.

DR. ULRICH: I just want to add a word in regard to standardization. The only instance of standardization of therapy in immunity is in the field of soluble poisons—toxins and antitoxins—in diphtheria, botulinus and tetanus. In the field of non-specific protein therapy we are dealing with an unknown chemical substance—protein—and its action on a body in which the laws of weight and mass come into play. So that each individual is a law unto himself. In each instance the dose is experimental and will always be so. There is no way of standardization.

2. DR. FARR (Minneapolis) reported a method of diagnosing so-called "potential" inguinal hernia by means of pneumoperitoneum in instances where the diagnosis could not be made clinically in any other manner except by operation. Dr. Farr stated that he considered that the use of this method, if experience shows that it is safe, will prove an excellent means of clearing up the question of the so-called "traumatic" hernia. Radiograms were shown.

DR. H. P. RITCHIE (St. Paul) gave a talk on some of the Problems of Treatment of Malignancy about the Face, Head and Neck, and illustrated it with numerous lantern slides.

DR. E. S. JUDD (Rochester) read a paper on "Diverticulitis of the Colon," which was illustrated with lantern slides.

Discussion: DR. A. SCHWYZER: Dr. Judd has spoken about the etiology of diverticulitis. This point is as yet all practically in the stage of speculation, and so one is allowed to speculate a little bit, too. Just a general weakness of the

wall of the intestine could hardly be considered an etiological factor because if the diverticulum is not congenital then we must consider it a pressure diverticulum where the mucosa and sub-mucosa are pushed out; in other words a very strong contraction of the intestine might bring it on with a comparatively weak spot in the wall.

Klebs found the diverticula to be located just where the vessels enter the intestinal walls and Dr. Judd has told us that they found diverticula comparatively frequently in fat people. If we now consider that fat especially locates around these entering vessels, we have here a gap in the muscular wall and a lack of resistance at this place during forcible contraction of the gut. I cannot help feeling that these severe contractions of the colon have their effect, especially when people can not always obey nature's call when it should be. Too much and too prolonged resistance to nature's call must therefore be detrimental.

Our old friend, Dr. S., had symptoms that looked like carcinoma of the colon and autopsy showed that he had innumerable diverticula from one end of the colon to the other, which reduced the colon to a hard thick cord.

I think a few meetings ago I mentioned a woman who had discharge of vesical calculi for many months. The patient one day brought calculi in in a box. There were more than twenty of them. They did not seem quite as firm as ordinary calculi, almost somewhat elastic. They were recognized as hardened fecal masses. The cystoscope allowed us to recognize a hole above the trigone. We opened the abdomen, went down along the posterior wall of the bladder until we got to a thick mass which we cut away from the bladder. A small opening into the bladder was closed. Then we dissected this mass from the lower colon which also had a fistulous looking opening into this mass, which was a thick inflamed diverticulum. Apparently the fecal matter had got into this diverticulum, gradually hardened and finally perforated into the bladder at regular intervals.

The wealth of material reported by Dr. Judd is striking for one who sees this class of cases only at long intervals. Perhaps the reason why we do not see more of this condition is that we do not go through our cases as readily with x-ray examination.

The meeting adjourned.

JOHN E. HYNES, M.D.,
Secretary.

PROGRESS

Abstracts to be submitted to Section Supervisors.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH
THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

POSTOPERATIVE MASSIVE PULMONARY COLLAPSE AND DROWNED LUNG: Simon S. Leopold (Amer. Jour. Med. Sciences, March, 1924).

The attention of the American medical profession is

called again in this article to the postoperative development of massive pulmonary collapse, a condition which is being recognized more and more frequently in this country and is no longer considered a clinical rarity.

The author reports four cases observed by him, which are reported in detail, with roentgenograms and reproductions of the clinical charts. A brief review of the history of the condition is given and speculation indulged in as to its cause, but no new theories are advanced, except that the observer is inclined to think that multiple factors operate in its production, restriction of pulmonary excursion on account of the immobility of the perithoracic musculature, and partial obstruction of the bronchus, due to the formation of mucous plugs in its lumen.

F. J. HIRSCHBOECK.

PLANNING A MODERN TUBERCULOSIS SANATORIUM: T. B. Kidner, Consultant on Institutional Planning, National Tuberculosis Association, New York, N. Y. (Modern Hosp., March, 1924.)

Some years ago tuberculosis sanatoriums were of the flimsiest possible type of construction as it was assumed that the patients would almost all be "ambulant." Today it is recognized that every case of active tuberculosis regardless of its apparent severity is a potential "infirmary" case and many hopeful recoverable cases actually require more or less prolonged treatment in bed. The outstanding feature of recent tuberculosis hospital and sanatorium plans is that they approximate more and more the general hospital type. In fact, as regards cases in the "infirmary" stage of treatment, the accommodation provided today in a tuberculosis sanatorium differs scarcely at all from that provided for patients suffering from other diseases in a modern general hospital.

This has naturally resulted in an increase in the cost of construction and calls for increasing attention to details of planning so that unnecessary features may be eliminated. For institutional purposes, tuberculosis patients are classified broadly as infirm, semi-ambulant and ambulant cases. Mr. Kidner believes that at least forty per cent of the accommodations should be arranged for bed cases.

Further, the accommodation for semi-ambulant cases (about thirty-five per cent of the patient capacity) should be so planned that, in case of need, bed care could conveniently be given. About one-fourth only of the total number of patients are likely to be strictly ambulant cases.

Not all the infirm cases need be tray fed; in point of fact, about fifty per cent of infirm patients can usually put on a dressing gown and walk to a local dining room, preferably adjoining the diet kitchen.

It should be possible to wheel any patient from his bed to a porch in fine weather, though it is not necessary to provide porches for all the single and two-bed rooms.

Suitable accommodation should be made for the medical and general administration of the institution. An elaborate operating suite is unnecessary except in a large institution. Public institutions of less than sixty beds or more than two hundred and fifty are not recommended. The former are uneconomical and in the latter it is difficult to secure a personal touch and family feeling between the staff and the patients.

Proper provision must be made for the more modern fea-

tures of sanatorium treatment, heliotherapy, occupational therapy and prevocational training.

Chiefly, effort should be made to meet the latest demands of medical science in the treatment and prevention of tuberculosis.

A. T. LAIRD.

ARTERIOSCLEROSIS AND HYPERTENSION: James O'Hare and Wm. Walker (Arch. of Int. Med., March, 1924).

The authors base their paper on the observation of sclerosis in the larger vessels of the body, and in the smaller vessels, as exemplified by the retinal arteries, in their relationship to hypertension. It has long been noted by observers that hypertension evidently has no relationship to arteriosclerosis existing in arteries of the first and second order of magnitude, and the belief is now definitely established that the relationship exists mainly in the association of a sclerosis of the smaller precapillary arterioles in hypertensive states. The latter vessels can be observed most easily in the fundus of the eye, and in a series of one hundred cases O'Hare & Walker have shown the definite relationship between sclerosis of the retinal arteries and high blood pressure, and that the peripheral vessels play little or no part in hypertension, primarily or secondarily.

In their work nothing was developed to prove that hypertension came first and sclerosis second, or vice versa. Since the retinal vessels are undoubtedly an index of the condition of the small vessels throughout the body, evidences of arteriosclerosis in the smaller retinal arterioles are presumptive evidence of hypertension, and it is suggested that further observation be made by observing the fundus microscopically according to the method of Cohen.

In 50 cases observed, who had definite sclerosis of the peripheral vessels, with normal pressures, the retinal vessels were found to be normal, or with only slight grades of sclerosis manifest, but in 50 cases with definite hypertension, sclerosis of the retinal vessels was marked in every case but two, with an age variation of from 23 years to 85 years. In the latter series, sclerosis of the peripheral vessels was also present from a slight to a marked degree.

F. J. HIRSCHBOECK.

AN OUTLINE OF A ROUTINE FOR INSULIN THERAPY: Leon Jonas and J. H. Musser (Amer. Jour. Med. Sciences, April, 1924).

The authors have worked out a very commendable and satisfactory routine for insulin therapy, which will be of distinct value to any one who wishes to undertake the scientific treatment of diabetes mellitus.

In a few pages the authors take up a classification based upon the treatment, rules for treatment, including insulin therapy, the evaluation of a ketogenic-antiketogenic balance, and, finally, tables of food values, height and weight, caloric requirements and dietary measures.

The authors state that there is no pretense at equivocation, that the statements made are dogmatic, with the realization that in an outline of this type there is no place for controversial matter. The subject matter should be of distinct value to the general practitioner who wishes to launch forth on a safe and sane therapeutic regimen.

F. J. HIRSCHBOECK.

GYNECOLOGY AND OBSTETRICS

SUPERVISORS:

ARCHIBALD L. McDONALD,

FIDELITY BLDG., DULUTH

L. W. BARRY,

LOWRY BLDG., ST. PAUL

DILATATION OF THE CERVICAL CANAL THROUGH ARTIFICIAL MUSCLE RELAXATION: (Zentobl. f. Gynak, March 15, 1924):

In some fifty cases where curettage was necessary the author employed local anesthesia. About 60 c.c. of a 0.2% eucaïne solution was injected into the parametrial tissues to the sides of the uterus. The needle was introduced directly under the vaginal mucosa of the portio vaginalis about 1 c.c. below the level of the vaginal vault. The solution was injected slowly, keeping the point of the needle in contact with the cervical musculature. As much as 80 c.c. of a 0.2% eucaïne solution was introduced with no toxic symptoms.

Spontaneous dilatation of the cervix was rapid and in most instances curettage could be carried out without employment of dilators.

If dilators were used the dilatation was painless. General anesthesia was unnecessary.

Postoperative bleeding and discharge were very slight.

Frequently the patients complained of a pressure pain on both sides of the lower abdomen. This pain usually had disappeared on the following day.

L. W. BARRY.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,

LA SALLE BLDG., MINNEAPOLIS

ROY N. ANDREWS,

MANKATO CLINIC, MANKATO

ACIDOSIS—A FAULTY DIAGNOSIS: DeWitt H. Sherman and Harry R. Lohnes (Archives of Pediatrics, November, 1923). The diagnosis "Acidosis," implying a distinct and definite disease, has become so common that we wish to present a strong protest against the careless use of this term by the medical profession. It is contended that the term "Acidosis" means merely a set of symptoms, and only a set of symptoms and rarely more, and that it fails to designate the basic factors that may be the cause of this set of symptoms. There are symptoms which have been named acidosis because of the presence of some of the following signs or symptoms, such as: high urinary acidity, acetone on the breath, acetone and diacetic acid in the urine, air hunger, persisting vomiting, stupor, etc., including all of the many signs and symptoms usually enumerated under the heading of "Acidosis." They are symptoms, it may be,

properly so named, but the term "Acidosis" designates a state, not a disease, just as fever indicates a state and not a disease, or just as coma indicates a state and not a disease. If, though, these symptoms-complex are present, it is our first duty to treat the existing condition, and then continue our study to remove, if possible, the underlying cause, and thereby prevent the recurrence of the condition. In the writer's experience, one of the commonest causes of so-called acidosis in children is an infection, and if we search hard enough we will very often find that the symptoms of acidosis are not infrequently associated with involvement of the nasopharynx. Another extremely common cause to explain the frequent so-called "bilious attacks" with its symptoms of acidosis, and sometimes called cyclic vomiting, is enteroptosis or elongated tortuous sigmoid. This occurs in the older children of four to eight years of age, and can generally be promptly relieved. As Talbot recently has told us: "Correct the malposition of the body with or without proper support of the abdominal organs and the bilious or acidosis attacks cease." Foreign proteids, which are toxic to certain children, produce these same symptoms. Among these, egg-white stands out most prominently, and we are appreciating more and more almost every day that there are a great many children who are mildly sensitized to foreign proteids of one kind or another. One or more cases of so-called cyclic vomiting or acidosis have been dramatically cured by relieving eye-strain. We feel now that among careful thinkers the diagnosis of "Acidosis" as an entity is being very generally discarded. The restriction of the diet, by lowering the proteids as well as the fats, may be distinctly harmful because, through malnutrition, it may decrease the child's immunity to infections or lower its resistance to intoxications. The diagnosis "Acidosis" should no longer be used by trained physicians except to designate a state.

R. N. ANDREWS.

REASONS FOR THE FAILURE TO OBTAIN RELIEF AFTER TONSIL AND ADENOID OPERATIONS: I. H. Goldberger (Archives of Pediatrics, November, 1923). Much has been written recently condemning tonsil and adenoid vegetation operations, the authors basing their objections on the failure to obtain relief from the many symptoms that prompted the removal originally of the suspected source of infection. It is the author's contention that children whose catarrhal symptoms do not subside after tonsillectomy and adenoidectomy are in reality suffering from accessory nasal sinus disease. Very little, if any, attention has been paid to the accessory nasal sinuses in children. Sinusitis may occur at any age. The fact that the antrum is the largest cavity at birth may explain its predisposition to infection so early in life. It is the hope of the writer that attention directed to the possibility that the accessory nasal sinuses may be involved, particularly when children fail to improve after tonsil and adenoid vegetation operations, will do much to give relief to these suffering individuals, and will add scientific refutation to the oft-mentioned statement "that children are operated upon needlessly, and without benefit accruing." They conclude that antral infection occurs in over 20 per cent of children with nasopharyngeal catarrh, and that antral suppuration is to be excluded as a possible cause of nasal catarrh in children, especially

when tonsils and adenoid vegetations have been removed. These patients are peculiarly susceptible to colds, which are refractive to treatment. There is anterior and posterior nasal discharge, usually thick, creamy, or green colored, and which seems to continue indefinitely. These children are usually underweight, pale, lack tone and vigor and frequently complain of vague frontal headaches. Lillie claims that a diagnosis is incomplete unless clinical findings and information to be derived from the roentgen-rays examination have been taken into consideration. The consensus of opinion is that operations on the sinuses should be resorted to only after all other procedures have failed.

R. N. ANDREWS.

BREAST FEEDING: Frank Howard Richardson (Arch. of Ped., Feb., 1924). The breast-fed baby has about five times the chance for life and health possessed by the bottle-fed baby. Every mother, given intelligent supervision and instruction, can nurse her baby as long as she and her doctor please. Every mother's milk is good milk, and can be depended upon to agree with her baby, up to the limit of the quantity present. That is, quality is practically never, but quantity very frequently is, at fault. Regular, complete emptying of the breast is essential to continued successful breast feeding. The best emptier of the human breast is the suckling child. The next best, which should be the only substitute tolerated, is the thumb and finger of the mother herself. This procedure should immediately follow the cessation of feeding. The breast-fed baby never over-eats, if fed at reasonably long intervals. This is true not only in breast milk, but also with artificial feeding used to complement the nursing. Laboratory examination of breast milk is worse than useless—it is misleading. So-called colic is usually a symptom of hunger, as can readily be determined by putting the crying child back on the breast. Or, if that is emptied, by offering him a complementary feeding. A rectum full of fecal matter interferes seriously with the appetite for nursing, hence, a soap suppository often greatly facilitates nursing. There is no special diet for the lactating mother, if she will but take a quart of fluid more than usual during each 24 hours. If this fluid is in the form of certified milk, all the requirements will be abundantly satisfied. Adequate rest and sleep are considerably more worth her giving serious thought to than is the question of her diet. Milk never permanently disappears suddenly. Vomiting on the baby's part is as a rule simply an automatic return of a slight excess of milk, or it may be due to a tight band, jolting, etc. It does not mean indigestion. The general practitioner or pediatricist who will not make himself master of the problem of breast feeding has no business to attempt the care and treatment of this age group.

R. N. ANDREWS.

NECESSITY FOR BETTER DENTISTRY FOR CHILDREN: Chas. B. Bray (Arch. of Ped., Feb., 1924). Children's dentistry has been the most neglected field of any of the branches of dental science. If we expect to eliminate focal infection from a dental standpoint, we must begin before it is established, and that certainly is in the early stages of childhood. There is little excuse for dead or ab-

scessed teeth in children, and with the exception of accidents, 99 per cent are caused by neglect or carelessness—lack of education, if you please. Temporary teeth require more care than permanent ones, because they are in a constant state of disintegration. They will not stand as much neglect as will the permanent ones. There are more children going through life today with crippled mouths, hearts, etc., due to neglected teeth and diseased tonsils than from any other cause of which we know. If we eliminate diseased mouths and infected tonsils in children, we will lessen by 50 per cent the child's chances of having the contagious diseases of childhood, such as are contracted or carried in the mouth and nasal passages. The author wishes to emphasize the fact that neglected and diseased teeth play as important a part in the production of systemic disease, and general impairment of health, in children, as we have long known they did in adults, and further, that the best treatment of these conditions is to prevent their occurrence by careful, scientific, and regular treatment of the teeth in childhood.

R. N. ANDREWS.

ROENTGENOLOGY

SUPERVISORS:

LEO G. RIGLER,
MPLS. GEN'L HOSPITAL, MINNEAPOLIS
A. U. DESJARDINS,
MAYO CLINIC, ROCHESTER

THE PATH OF A BEAM OF HARD RAYS IN THE LIVING ORGANISM: Warren and Whipple. (Jour. Exp. Medicine, Dec., 1923.) Using the same experimental methods as previously described, the authors attempted to determine the actual course of a cone of x-rays, applied to the abdomen of a dog. The usual dosage and screening applied in moderately deep therapy were used, the body being protected by lead except for the area to be radiated. After various intervals, following the radiation, the abdomen was opened and the areas of intestine which showed lesions were examined. The lesions were found to be sharply confined to a certain area corresponding to the area radiated and the skin burn. The border between normal mucosa and the ulcerated portion was sharp and it was apparent that there was no dispersion of the rays. The area of intestine affected by the rays indicated that the cone of radiation traveled out from the target along the radii of increasing spheres. If secondary radiation was formed in the tissues it had no injurious effect upon the intestinal mucosa. Even deep in the abdomen the lesions were sharply demarcated, clean-cut, and confined to the same area. The experiments indicate that x-rays, which injure intestinal epithelium, travel in straight lines in the form of a cone, without dispersion or scattering of the primary or secondary rays. The authors can accurately predict the lesions in the stomach and intestine following a measured, confined dose of x-rays.

LEO G. RIGLER.

DIE BEHANDLUNG DES RÖNTGENKATERS MIT HYPERTONISCHEN LOSUNGEN. ZUGLEICH EIN BEITRAG ZUR FRAGE IHRER WIRKUNG—A. Mahnert and H. Zacher (*Wiener klinische Wochenschrift*, vol. 36, pp. 129-130): Holznecht and Sielman have written on the influence of salt on röntgenkater in the form of clysmas and particularly as intravenous injections of 10 per cent salt solution. This has led the authors to report their experiences of treating röntgenkater with a hypertonic solution of glucose.

In a series of cases of carcinoma of the uterus or ovaries which were irradiated, and also in prophylactic irradiation after radical operation in which röntgenkater appears after intensive irradiation, the authors have attempted to relieve the symptoms by intravenous injections of glucose. They use ordinarily 40 cm. of 25 per cent solution and the röntgenkater symptoms (dizziness, vomiting) usually disappeared completely in one-half to one hour. Even 40 per cent solutions were used without disagreeable effects. Injections of glucose before irradiation did not prevent the symptoms of röntgenkater. It was necessary to use not only a hypertonic solution of salt but also a highly concentrated glucose solution. Sielman believes that the solution of salt is the important matter, and Steyskal wonders if it is not a question of the effect of hypertonic solution in general.

A general effect is probably to be expected on the addition of a hypertonic solution in the blood stream as the production of the resulting fluid may be placed parallel to that of a rectal or subcutaneous infusion of an isotonic solution. The change in water content after an injection seems significant as it produces alkali in the blood. This alkali is very important in the treatment of röntgenkater since intensive irradiation changes the relation of acids and bases in the blood, and the tendency is in the direction of acidity. If salt is scarce in the blood a change in the blood is expected. If a hypertonic salt solution is brought into the blood we not only affect the water economy of the organism and the interchange of matter between blood and tissue, but also influence the metabolism of albumin. Perhaps this is the reason that prophylactic addition of salt before irradiation is without effect. Also for the effect of intravenous injection of highly concentrated glucose solution one must assume that as a hypertonic solution they have an influence on the distribution of the stability of the blood in the organism. But at the same time easily oxidized matter is brought in which is influential for the flowing off of the oxidation not only in regard to metabolism but also in burning of albumin molecules. It is these metabolic processes which in irradiation are changed significantly. Perhaps it is these which might explain many changes in the blood and in the urine of patients who have had x-ray treatment. Changes in the blood plasma are very closely connected with metabolism in the tissue after irradiation.

A. U. DESJARDINS.

ROENTGENOLOGIC DIAGNOSIS OF CHOLECYSTIC DISEASE: Carman, MacCarty and Camp (*Radiology*, Feb., 1924).

This paper gives a systematic discussion of the subject,

including a complete bibliography. An attempt is made to correlate the roentgenological findings with the pathology. Cholecystic disease is extremely common, being diagnosed clinically in 5% of all cases seen in the Mayo Clinic in 1922. They found disease of the gall-bladder in 64% of their last 100 necropsies.

The authors describe their technic in detail, the most notable point being that they do not use the Bucky diaphragm in gall-bladder plates. A clear and complete description of the method of interpreting gall-bladder roentgenograms is given with an analysis of the sources of error encountered. The authors are inclined to believe that the "indirect" signs of gall-bladder disease are of little value. Their study is made entirely on the direct signs, that is an enlarged gall-bladder shadow or the presence of gall-stone shadows.

A statistical study of their results in 410 cases coming to operation, on whom a definite roentgen diagnosis was made, is presented. The conclusions from this study indicate: (1) An affirmative definite diagnosis of pathological gall-bladder from the roentgen examination is highly reliable, being correct in 97%. (2) A negative diagnosis is worthless, correct in only 17.4%. (3) Of 364 cases in which pathology was found at operation, only 164 or 45.1% were diagnosed correctly. These included gallstones also. (4) 38.4% of all the cases in which gallstones were found at operation had been diagnosed correctly with the roentgen examination.

A statistical study of the pathology found indicated that an affirmative diagnosis could be made in 52.9% of the cases showing mild or extreme grades of disease, while a negative diagnosis was made in 44.6% of the same cases. The fact that the truly normal gall-bladder is so rare in adults throws some doubt on the roentgen findings as being truly indicative of clinical disease. The authors question the value of the roentgen examination if only 50% of the cases can be diagnosed.

It is pertinent to note in this connection that the use of a more elaborate technic might give a higher percentage of correct diagnoses. It would be of considerable value to know in what percentage of cases the diagnosis was made roentgenologically when the clinical diagnosis was wrong or obscure.

LEO G. RIGLER.

SPONDYLOLISTHESIS A COMMON LUMBOSACRAL LESION: Bowman (*Amer. Jour. of Roent.*, March, 1924).

Spondylolisthesis refers to anterior subluxation of the body of the 5th lumbar vertebra on the sacrum. Numerous etiological factors have been presented but injury is probably the most common cause. The author presents six cases with roentgenograms which clearly show this condition. In five of these injury was the cause. The condition is probably more common than is generally supposed and the failure to recognize it is due to lack of care in obtaining lateral views of the lumbo-sacral joint. In order to obtain good detail he advises one plate to be taken in the lateral position, using a small cone, the central ray being directed through the joint. All cases of injury to the back or of

lumbar pain should be x-rayed in this manner and dislocation of the lumbo-sacral joint will no doubt be found in a large percentage of cases.

LEO G. RICLER.

A ROENTGENOLOGIC STUDY OF BENIGN TUMORS OF THE STOMACH—Moore (Am. Jour. Roent., January, 1924): A report of 23 cases of benign tumors found at operation which had been studied roentgenologically is presented, together with illustrations. Most of the tumors were found at the pyloric end of the stomach and on the anterior and posterior walls. Over half showed superficial ulceration. The clinical syndrome is very indefinite.

The author reviews the roentgenologic findings in these cases from which he has formulated the following signs:

1. A filling defect, well circumscribed and punched out, is found.
2. The defect is usually on the gastric walls, rather than on the curvatures.
3. The rugæ around the tumor are more normal than found in other conditions.
4. Peristalsis is little disturbed, retention is uncommon.
5. No niche, incisura, or spasm are present.
6. The mass is rarely large enough to palpate.

The most essential feature of the examination is deep and thorough palpation to approximate the gastric walls. Differentiation must be made from: 1. Medullary carcinoma, by the irregularity of the defect, involvement of the curvatures rather than the walls, and presence of a palpable mass; 2. Crater of an ulcerated cancer, which gives a denser meniscus shadow; 3. Scirrhus carcinoma and lues, which give a diffuse involvement, narrowed lumen, and absence of peristalsis. It is almost impossible to distinguish annular carcinoma or saddle ulcer, while prolapse of a pyloric tumor into the duodenum may give the appearance of a duodenal ulcer. Gastric polyposis gives a characteristic mottled appearance which must not be confused with the appearance of food remnants. The differentiation from malignant tumors cannot be absolute, but the attempt should be made.

LEO G. RICLER.

TUBERCULOUS LOBAR PNEUMONIA (PNEUMONIC CASEOUS TUBERCULOSIS)—Sante (Am. Jour. Roent., January, 1924): In the past four years the author has seen 13 cases of lobar pneumonia with a protracted course, which eventually proved to be tuberculous. Clinically, the essential difference from a true lobar pneumonia lies in the mildness of the symptoms, the defervescence by lysis, and the failure to resolve. Practically all the cases occurred in the upper lobes. The sputum may show tubercle bacilli.

Roentgenologically, the cases resemble the ordinary lobar pneumonia very closely. In 2 cases the progress of the process was followed from its inception and in these showed the first consolidation at the hilus, then extension into the lower portion of the upper lobe, finally complete involvement of the lobe. Most of the cases show other

evidence of tuberculosis in the lungs. Resolution may not occur for months. After resolution, cavities were found in all but one case. These are multiple, well defined, and may become fibrosed.

Pathologically, this is an exudative type of tuberculosis. It is possible that much of the shadow found in the plates is due to ordinary inflammatory process. Since the advent of the roentgen ray the number of cases discovered has been greatly increased, so that the condition is not as rare as it was thought to be. The author believes that many of the dense shadows seen in pulmonary tuberculosis may be simple inflammatory processes, rather than an advancement of the tuberculous process. Well-reproduced plates of the cases are shown.

LEO G. RICLER.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

GENITOURINARY DISEASES AND SYPHILIS. Henry H. Morton, M.D., F.A.C.S., Professor of Genitourinary Diseases and Syphilis, Long Island College Hospital, Genitourinary Surgeon to the Long Island College Hospital and Polhemus Memorial Clinic, etc. Fifth edition, revised and enlarged. 328 illus. 38 full page colored plates. 712 pages. New York: Physicians and Surgeons Book Co., 1924. Cloth, \$10.00.

MEDICAL SANITARY INSPECTION OF SCHOOLS. S. W. Newmayer, A.B., M.D., formerly Chief of Division of Child Hygiene; Assistant Chief Medical Inspector, Bureau of Health; Supervisor of School Medical Inspection, Philadelphia. 79 engravings. 6 full page plates. Philadelphia and New York: Lea & Febiger, 1924. Cloth, \$4.00.

MODERN UROLOGY. Hugh Cabot, M.D., C.M.G., F.A.C.S., Dean and Professor of Surgery in Michigan Medical School, Ann Arbor. Vol. I. 828 pages. 398 engravings. 11 plates. Vol. II. 744 pages. 288 engravings. 8 plates. Philadelphia and New York: Lea & Febiger, 1924. Price of both volumes, \$18.00.

NEW AND NON-OFFICIAL REMEDIES, 1924, containing descriptions of articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association on Jan. 1, 1923. Cloth; pp. 422+XXXIX. Price, postpaid, \$1.50. Chicago: American Medical Association, 1924.

Every physician is continually bombarded with literature, scientific and otherwise, concerning the newer remedies. He has neither the time nor the opportunity to investigate all even of the more promising preparations, and obviously he cannot try them upon his patients without investigation. He must know the composition of the article, must know that the claims under which it is marketed are true; in other words, he must have some critical statement of the actions, uses and dosage as well as of the chemical and physical nature of the product.

This need of the physician is met in New and Non-official

Remedies, which is the official publication through which the Council on Pharmacy and Chemistry annually presents to the American medical profession disinterested, critical information about the proprietary preparations which the Council deems worthy of recognition. In addition to the description of these proprietary preparations, the book treats those non-official remedies which, in the opinion of the Council, are worthy of consideration.

As the book is designed for ready reference, each preparation is classified, and each classification is preceded by a general and critical discussion of that group. These articles are written by those who may speak with authority on the separate subjects, and are a compilation of the best accepted opinions of today. Thus there is a general article on lactic acid-producing organisms in which the newly accepted *Bacillus acidophilus* preparations are discussed in connection with other accepted sour or fermented milk preparations. The animal organ preparations, the biologic preparations, the arsenic preparations, and so on, are discussed in such a manner as to make the accepted facts concerning each group readily available.

A glance at the preface of the new volume will show that the book has been extensively revised. In fact, each new edition of New and Non-official Remedies is essentially a newly written book, fully indexed.

Physicians who wish to know why a given proprietary is not described in New and Non-official Remedies will find the References to Proprietary and Unofficial Articles not found in N. N. R. of much value. In this chapter (in the back of the book), there are references to published articles dealing with preparations which have not been accepted.

New and Non-official Remedies is a book that a physician who prescribes drugs cannot afford to be without. The book contains information about medicinal products which cannot be found in any other publication.

The book will be sent postpaid by the American Medical Association, 535 North Dearborn Street, Chicago, on receipt of \$1.50.

ANNUAL REPRINT OF THE REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR 1923. Cloth; 72 pp. Price, postpaid, \$1.00. Chicago: American Medical Association, 1923.

This volume contains the unabridged Council reports that have been adopted and authorized for publication during 1923. Some of the reports, due to their technicality, have only been abstracted in *The Journal*; others have been published in entirety, and still others have never been published elsewhere.

In this volume the Council sets forth the reasons that certain proprietary remedies were found unacceptable for New and Non-official Remedies, the reason why it has been deemed wise to omit certain hitherto accepted articles from the present, 1924, edition, of New and Non-official Remedies, and the volume also contains certain preliminary reports on products that have therapeutic promise, but are as yet in the experimental stage. There is a long report on the widely advertised Fleischmann's Yeast, which was not found acceptable. Benetol, another article that has had much mention in the daily press, receives attention. There are reports on apiol and mercurial oil, which have been omitted from New and Non-official Remedies. In addition to these types, there are preliminary reports on bismuth in the treatment of syphilis, ethylene as an anesthetic, peptone in the treatment of migraine, and tryparsamid; and there are reports of such general interest as that on intravenous therapy and that on progress and conservatism in therapeutics.

For one who wishes to be cognizant not only of what the Council has done, but why it has done it, the book will be very valuable, for it supplements New and Non-official Remedies with a more detailed account of the activities of the Council during 1923. New and Non-official Remedies records those proprietary remedies which have been accepted; Council Reports treats those which have been found unacceptable, and those which give promise of becoming valuable.

WANTED—Partner or assistant. Large general practice, Minnesota town 800. Territory extensive. Work for two men. Community German Catholic. Hospital next town. Will sell half interest in equipment and business or arrange percentage basis. Young German Catholic with some surgical ability preferred. Only Class A graduate with hospital experience considered. Give age, nationality, religion and references. Address B91, care MINNESOTA MEDICINE.

FOR SALE—Long established practice in town of 2,500. Prosperous community, sixty miles from cities. A snap worth investigating. Specializing. Address B-93, care MINNESOTA MEDICINE.

FOR SALE—General practice in St. Paul of physician recently deceased. Also complete office equipment. Any reasonable terms. Address B90, care MINNESOTA MEDICINE.

GOOD LOCATION—Dentist and physician, corner Thomas and Hamline Ave., Saint Paul, above drug store. Inquire at 1344 Thomas Ave. Telephone: Midway 5467.

FOR SALE—Complete equipment of twelve-bed hospital, including beds, linen, office and operating room furniture, enamelware and rubber goods, dishes, trays, silver and glassware, also wheel chair, bassinets, and various room furniture. In excellent condition. Used only six months. Price very reasonable. Address P. O. Box 135, Elk River, Minnesota.

FOR SALE—Static machine, twelve-plate, in quartered oak, good condition. Does good fluoroscopic work on the extremities. Price \$35.00. Compressed air tank with pressure gauge, good condition, \$5.00. Two x-ray tubes, 6 inches by 8 inches, any fair offer. Leaving state. Address B88, care MINNESOTA MEDICINE.

FOR SALE—Office fixtures and instruments of physician recently deceased. Good opening for practice in southern Minnesota town, 2,000. Address B89, care MINNESOTA MEDICINE.

GOOD OPENING for general country practice at Kindred, North Dakota. For information address B-92, care MINNESOTA MEDICINE.

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ORIGINAL ARTICLES

PRESIDENTIAL ADDRESS: OBSTETRICAL RESULTS*

F. P. STRATHERN, M.D.
St. Peter, Minn.

LADIES AND GENTLEMEN:

You have honored me beyond my merit with the highest office in this association, and for the past year and a half it has been my humble pleasure to serve to my utmost ability your best interests in promoting the ideals and traditions of the Southern Minnesota Medical Association. This organization has no axes to grind but is wholly interested in bringing together, once a year, all members of the association and their friends, regardless of geographic boundaries. Primarily, its object is to increase knowledge and skill in the healing art, to build up a more ethical and tolerant profession and emphasize, most of all, the needs of the general practitioner.

I wish to quote Dr. Hugh J. Means, speaking before the Columbus (Ohio) Academy of Medicine, voicing a thought that is now quite firmly entrenched in the minds of practitioners all over the country, when he said: "The cults always have been, are and always will be with us. Too much effort is expended in attempting to suppress the fact of the day and not enough in searching for the true cause that enables it to exist. Physicians, as a whole, pay too little attention to the psychology of medical practice and consider medicine as an exact science, forgetting that the patient is an individual with prejudices, idiosyncrasies and temperaments. A keen analytical mind in ordinary affairs will function in an absurdly illogical manner in health matters. When a patient consults a physician, his mind is made up in advance that there is something wrong. When told that his illness is merely a state of mind or something of small mo-

ment, he may appear satisfied; but deep in his heart he is disappointed. We all rather enjoy the opportunity to excite a little sympathy for ourselves and after recovery like to think that our illness was a little more severe than ordinary. The patient wants something done to him. The less serious his condition, the more the process is enjoyed; not being satisfied merely with advice, which to his unscientific mind is more or less intangible, the patient drifts to a healer. It may be generally admitted that physicians themselves are responsible to a large degree for the drift to cults of persons who complain of being ill, when no definite pathology is present, because of a disposition to dismiss the patient with the admonition that "there is nothing wrong."

Let us say that one-third of the patients who consult a physician are scarcely in need of medical attention, as far as real demonstrable ailments are concerned. These patients are entitled to careful, thorough examination and attention and not the usual cursory hurried examination with a little indefinite advice regarding habits and possibly a few recommendations as to eating and exercise. Thus, patients pass from one physician to another and, receiving the same attention and advice, gradually become more and more dissatisfied. This is the main reason for quack cults, practices and all manner of irregulars. If a patient leaves the office unsatisfied, it is usually the fault of the physician. We have never heard of a patient consulting an irregular and being dismissed without the recommendation of a complete course of treatment and it would be difficult to estimate how many millions of dollars fall into the hands of the unqualified, the unscrupulous and the rank unethical.

This problem is worthy of the most serious consideration. How are we to treat these patients? There can be but one answer. We must give this type of patient the time and serious attention he deserves or he will continue to encourage and patronize the ignorant and unqualified. Hygienic instruction and sensible advice are all available and distinctly helpful, but the average patient is not

*Read before the annual meeting of the Southern Minnesota Medical Association, Mankato, May, 1924.

satisfied with this. He or she, especially she, wants some kind of active treatment upon which hope and confidence can be based. Because these patients will probably recover without active treatment is no good reason for relying entirely upon the unaided forces of nature. Many of them will be satisfied with this and will need no further attention; others will require helpful direction and re-education, even medication, though its effect is more mental than physical in character.

In order to combat the cultist, the practitioner will find it to his advantage to at least know on what his practice is founded. He will find, very likely, that regular medicine can give every real advantage offered by the special cult and more. The patient can be advised by his physician as to diet, water intake, exercise, relaxation and even as to attitude of mind. "The doctor of today has greatly neglected his psychology and has given to the mental healer an unusual opportunity," says Dr. Hubbard of the New York Board of Health. "If the physician does not intellectually respect the complex matters of the soul and their interdependence," to quote the late Dr. Wier Mitchell of Philadelphia, "he is unfit for higher seats in the temple of healing. Through closely studying and appraising his enemy, the unqualified practitioner, and especially keeping in touch with the latest developments in both medical and mental science, the physician of the legally recognized schools can successfully cope with the menace of the cults."

Great advancement in medicine during the past twenty-five years has been accomplished and a few of the more important discoveries may be briefly mentioned.

Major Walter Reed and James Carroll in 1899 proved the cause of yellow fever to be either an ultramicroscopic organism or a filterable virus transmitted to man by a particular species of mosquito, the *stegomyia fasciata*.

A quarter of a century ago, our teachers talked of the etiology of lues. The *spirocheta pallida* was unknown. In May, 1905, Fritz Schandinn, working with Erick Hoffmann, crowned his life work by the discovery of *spirocheta pallida*. This was the first step in the conquest of syphilis. The next was the biochemical discovery in 1910 by Paul Ehrlich of Strehlen, Silesia, of salvarsan, and his work enabled August von Wassermann in 1916 to hit upon the specific and extremely reliable diagnostic test for syphilis.

One of the greatest medical achievements in the World War was the conquest of wound infection, through the introduction in 1915 by Carrel and Dakin of a physico-chemical principle of wound irrigation by a gas in solution.

A student senior of the University of Minnesota in 1899 was asked in a quiz class of the late Dr. Alexander Stone how he would diagnose a stone in the ureter. To the consternation and amusement of the class, he replied: "I would pass a probe into the ureter." The professor replied: "Young man, you will be dead and resurrected a thousand years before you will ever pass a probe into the ureter"; but the introduction of the cystoscope by Max Nitze in 1916 vastly improved the surgery of the bladder and ureter.

The discovery of insulin by Banting and Best marks an epoch in the treatment of diabetes, the previous treatment of which had been so unsuccessful and discouraging. This remedy will prove invaluable in prolonging and saving valuable lives. In time I hope there will come a demand for a course of instruction in our public schools in dietetics which might serve to check the apparent increase in this prevalent disease.

One of the reasons why physicians in general have failed to hold or to satisfy their patients is the fact that no record is kept of their cases; were this done and case records reviewed and studied it would prevent repetition of mistakes in diagnosis and treatment and aid in cleaning up the cult problem. This, of course, takes time, but it pays to do it.

Our records of obstetrical patients, kept for twenty-five years in a country and city practice which totaled 1,032 cases, very few of whom were hospitalized, serve as an illustration. The anesthetic was chloroform; gas or ether was used in a few cases. No untoward effects were observed and I would say that chloroform, intelligently and properly administered, is a very satisfactory anesthetic in obstetrical work. Gas tanks are too cumbersome to carry and its administration is impractical in that assistants are, as a rule, few and untrained and the physician must perform the added duty of nurse and anesthetist. When the labor pains are sufficient to insure continuance, the anesthetic is administered in amount to relieve the sharp edge of the pain. At the completion of the second stage, the anesthetic is pushed to primary

anesthesia and seldom, if ever, do I have a case of nausea or vomiting following delivery.

As to abnormal presentations and complications of pregnancy, we note the following:

Post partum hemorrhage.—Fourteen cases in number. Most of these cases were controlled by the usual measures such as kneading the uterus and the administration of ergot and pituitrin; but a few cases required a pack for several hours. Holding and firmly manipulating the fundus usually will prevent and control hemorrhage, except in uterine inertia or laceration of cervical vessels.

Contracted pelvis.—Ten cases. Seven of these, all in the same mother, were very difficult, required forceps, and resulted in the loss of three of her infants from pressure and asphyxiation. The last and most difficult of all, was a breech presentation. Failing in external version, the aftercoming head was finally delivered with forceps. The eighth case, a primipara seen too late to remove to a hospital, was delivered, with the assistance of two other physicians, by forceps, resulting in the child's death due to pressure and asphyxiation. The mother was advised in the future, should the occasion arise, to go to a hospital for cesarian section. This she failed to do and, in the hands of another physician, delivery resulted fatally to the child. Her third delivery, an operation at Rochester, resulted favorably to mother and child. This demonstrates the importance of careful repeated examinations and watchfulness to detect complications in advance, so as to be prepared for any emergency. The ninth case of contracted pelvis was in a primipara, upon whom a cesarian section was performed successfully. The mother, a minor, lived to appear in court as a witness against her seducer, who was duly sentenced to serve a term in the State Penitentiary.

Adherent placenta.—Seven cases. All required manual removal, but with uneventful recovery.

Twins.—Seventeen cases with two infantile deaths. One case of triplets was ushered into the world. The diagnosis was twins. The first infant, a female, weighed three pounds and was born 4:15 a. m. This satisfied the fond father, who had previously notified me that future calls would not be forthcoming if the prospective was not a girl. But complications arose and the second child, a female, weight three and one-half pounds, was born at 5 a. m. The third child, a female, weight two and one-half pounds, was born at 5:10 a. m. This was more than the father had figured on and I assured him that he was abundantly supplied with girls, to which he replied: "Well, I did not want three." The mother and children are doing well.

Breech presentations.—Thirty cases. Two of these cases were high, so that a hook was used around the groin over the thigh, resulting in perforations of the abdominal wall at Poupart's ligament in both cases. The wounds under treatment healed quickly. One case with prolapsed cord was delivered successfully, but another with premature rupture of membrane was very difficult. One must have a fully dilated cervix for delivery of the aftercoming head, the danger being that the aftercoming head will be caught by the insufficiently dilated cervix and unless the child is delivered in from five to seven minutes from the time of the appearance of the cord at the vulva, death may result. The extraction of the aftercoming head in this case required

forceps, the resulting trauma and traction causing its death the following day.

Stillbirths.—Twenty-eight cases. A version was performed in one case of malposition, but on account of the extreme size of the aftercoming head, craniotomy was necessary. Of the remaining, one was a monstrosity; one, a dry labor breech presentation; four, contracted pelvis; one, strangulation by the cord before my arrival; one, strangulation with loops of cord in forceps; and the rest to causes such as prematurity, lues and asphyxiation by prolonged labor.

Dry labors.—Thirty-four cases. Rupture of membranes prematurely ranging from a few hours to seven days.

Version.—Six cases. One for pendulous abdomen and non-engagement of head; one, placenta marginalis; one, placenta abruptio; and the rest for causes already mentioned.

Eclampsia.—Three cases. One, postpartum, made a good recovery; one, antepartum and postpartum with recovery of mother and child; and one in which albuminuric retinitis forced induction of labor at eight months, with uneventful recovery.

Posterior positions.—Nine cases with one death from version.

Face presentations.—Nine cases.

Placenta marginalis.—Four cases.

Placenta centralis.—One case, eight months parturition, no fatalities.

Acute appendicitis.—One case. Abscess was drained at hospital, seven days postpartum, with good recovery.

Uremia.—One case, ten days postpartum, with maternal death.

Bartholin gland abscess.—Two cases.

Deformed and crippled cases.—Twelve in number. One, a bifid thumb at the second joint, was operated under local anesthesia while the child slept; one case, absence of left forearm and hand; two cases each with twelve toes and twelve fingers, which supernumeries were amputated at birth with excellent result; club feet, four cases; one infantile hand with web fingers to the second joints.

Spina bifida.—Three cases. One, located in the cervical region, was operated in the city about the second month with good recovery; the other two, in the lumbar region, the thin membranous type, became infected, resulting fatally.

Hydrocephalus.—One case, which died.

Two interesting cases should be mentioned: One was a child with cranial tabes; rectal palpation gave the impression of a breech presentation; delivery was slow on account of sluggish uterine contractions. The soft head presented a large hernia of the vertex, which was due to the absence of bony structure of parts of the parietal and temporal bones. Strange to say, this filled in with bony growth in a few months. The other case, of lesser involvement about the posterior fontanelle, looked like an ordinary caput succedentium, but was really a hernia of the brain, 7.5 to 10 cm. in diameter. This gradually disappeared with complete ossification in three months.

Ectopic gestation.—Two cases. One was sent to the hospital with recovery from operation and one died before she could be taken to the hospital. This was about twenty-five

years ago. With modern good roads and auto ambulance, we most likely could have saved her.

Two mothers died of pulmonary tuberculosis shortly after childbirth and one with influenza died suddenly in the second stage of labor.

Forceps cases.—One hundred and sixteen. The large majority were normal cases in which advance was delayed in the parturient canal or a long or dry labor threatened to exhaust the mother, endanger the child by asphyxiation or give rise to hemorrhage from uterine inertia. Forceps are a very great help when indicated, but one should always study the indications carefully and wisely before applying them, as the normal delivery is the safest to mother and child. How many times have we thought we would need forceps and have had them boiling to find that the child was born before we could use them.

Pituitrin is a valuable aid only where wisely used. With an undilated cervix or a posterior high position, to give pituitrin invites disaster. These cases are best treated by correcting the posterior position, or ironing out the rigidos with the sterile gloved fingers, by performing a version or applying forceps. In this way a ruptured uterus or a dead child will be averted.

The late Dr. Merritt, a most excellent obstetrician, informed me that he had never applied forceps to a living child without bringing it alive into this world. This requires great skill, experience and good judgment, and one should well strive to attain this proficiency.

INSULIN AND KETOSIS

Ketosis is not confined solely to cases of diabetes. It is an accompaniment of carbohydrate starvation, however produced. Acidosis is not infrequently found in preoperative or postoperative conditions, owing to enforced deprivation of food for one reason or another. It is found accompanying so-called toxic vomiting, sometimes particularly in the persistent type seen in pregnancy. Attention has been called to the use of insulin in the treatment of nondiabetic acidosis. The alleviation of this condition through the administration of glucose by rectum or parenterally has been demonstrated. More prompt success has been reported through the combined use of insulin hypodermically and glucose intravenously. While the treatment gives promise, it is not free from danger. Insulin therapy demands care in the case of a diabetic patient. Doubly great is the need of intelligent precaution with the nondiabetic patient.—*Jour. A. M. A., May 24, 1924, p. 1695.*

RADIUM AND RADIUM EMANATION

Radium is commonly supplied in the form of radium salts enclosed in containers. Also, tubes containing radium emanation are available. Salts of radium disintegrate at a rate so that 1,780 years elapse before the compound loses one-half of the initial activity. On the other hand, radium emanation loses about 0.75 per cent of its activity each hour, and consequently its activity is practically gone after one month.—*Jour. A. M. A., May 3, 1924, p. 1462.*

RECONSTRUCTIVE SURGERY AND REHABILITATION—THEIR RELATION TO SURGERY OF TRAUMA*

HARRY E. MOCK, M.D., F.A.C.S.

Chicago

In the field of general surgery and in the special fields of orthopedic and plastic surgery are found many deforming conditions which, uncorrected, handicap the individuals, rendering them unfit to compete in employment and to enjoy the usual pursuits of the average able-bodied man. During the war many old methods were revived and new ones invented which aimed at the prevention or correction of physical deformities. This work was classified as physical reconstruction and the necessary surgery used to overcome the disability was called Reconstructive Surgery. This type of surgery combines with the necessary surgical procedures such adjuncts as physiotherapy, occupational therapy, retraining exercises, and a continuous follow-up or supervision of the case, by the surgeon, until as complete a functional restoration as possible is obtained.

Many of these handicapped individuals are so badly disabled that function cannot be restored to the point of permitting return to their old occupation, therefore, hand in hand with the developments in medicine and surgery resulting in consideration of reconstructive measures, has been born an economic development known as Rehabilitation of the Disabled. Rehabilitation deals with those measures necessary to make a disabled individual fit to resume his economic position in society. Rehabilitation of the disabled embodies five logical steps, often overlapping in function, but all aiming at the final economic end-result, independency.

These steps are:

1. Physical and mental restoration, by adequate and completed medical, surgical and hospital care;
2. Convalescence, under environment which tends to retrain work habits, to harden and strengthen the individual rather than under environment which tends to hospitalize, parasitize and make possible the development of functional neuroses;

*Presented before St. Paul Clinic Week, St. Paul, January, 1924.

3. Retraining, when necessary, for a new occupation, or an occupation allied to his old work—called vocational training;
4. Replacement at suitable employment;
5. Continued medical and economic supervision to see that his rehabilitation is completed and so remains.

Prior to the war examples of rehabilitating the disabled were found chiefly in the work of the medical departments of a few great industries. The return of their permanently disabled employees, following work accidents, to new types of occupations which they could carry on and which usually had some incentive for advancement; the selected occupations for their cardiac cases; the treatment in sanatoria of their tuberculous employees and, when the disease was arrested, their return to selected, suitable occupations in the plant, all furnish excellent examples of the meaning of rehabilitation. Unfortunately only a very small percentage of the total disabled population of the nation was included in this number. Nevertheless this pioneer work paved the way for this new medico-economic movement.

During the war the medical department of the army developed great plans for the Physical Reconstruction and Rehabilitation of the Disabled Soldiers. Suffice it to say that prior to the wholesale discharge of these disabled soldiers following the armistice, this work of salvaging these men was progressing exceedingly well. It was during these months that the foundation was laid for the present scope of the rehabilitation movement. Time and again it was pointed out that the casualties from the great industrial army in this country were annually more than three times as great as the casualties in our military army for the entire war. Yet no national movement for the reclaiming of these disabled civilians had ever been launched.

As a result of this propaganda New Jersey in 1919 passed the first state law for the Vocational Rehabilitation of the Disabled from Industry. Since then thirty-five other states and the Federal government have passed similar laws—some of them broad enough to include the disabled from disease, accident or congenital deformity. These laws all provide for the vocational training of these disabled, the furnishing of artificial appliances when necessary and the replacement at suitable employment; the funds for this service being furnished by equal appropriations from the state and federal

governments. Five of the states function without federal aid. The laws are broad enough to include physical restoration, and are so interpreted in a few states, for they read: "To render a disabled person *fit* for remunerative employment."

All working in this field now realize that a great many of the cases can be improved physically, and must be so improved, before their vocational training and their economic rehabilitation can be assured. Thus reconstructive surgery, or medical reconstruction, is often the connecting link between the disabled and his future remunerative occupation.

Estimates differ as to the number of disabled in each state entitled to the benefits of the rehabilitation act. Thus, in Illinois, one group has reported that approximately 1,000 persons annually will be found needing this service, while another group claims that over 100,000 permanently disabled men and women can be found coming under the act. Remember that the total number of disabled now in our midst are being added to annually by the increasing number of industrial, automobile and public utility accidents. Statistics quoted by me* showed that annually 875,000 people were disabled for more than four weeks by industrial accidents alone; that 76,000 suffered loss of members; that 200,000 were otherwise permanently disabled and that 28,000 of our people were killed in industry. Statistics quoted by other writers since then show even a higher casualty list. This does not include the thousands who are disabled on our streets, in the homes, on the farms; neither does it include the disabled from occupational diseases, the cardiacs, the tuberculous, the paralytics, the mental defectives and others disabled by disease and congenital defects. All of these cases, if above the working age, are entitled to rehabilitation by the states having such laws. The great majority require some form of physical reconstruction to *fit* them for remunerative occupation. These facts give one some conception of the size of the medical and surgical problem involved.

Every paper or address should have some real motive for its publication or delivery. Lest you miss the objects of this paper, I want to insert here the two points I am endeavoring to drive home:

1. To increase the knowledge of our profession concerning these rehabilitation laws, and the im-

*Reconstructive Surgery, Minnesota Medicine, June, 1921.

portance of every physician referring his permanently disabled patients to the proper authorities so that they may receive this great opportunity of economic independence.

2. To urge the early application of reconstructive measures to every serious injury case, with the view of preventing permanent disabilities as far as possible, and of preventing traumatic neuroses and habits of idleness and dependency which frequently are more disabling than real deformities.

It is surprising how few of our surgeons, and our hospitals, have any real knowledge concerning rehabilitation or the fact that their permanently disabled patients can be referred to the state rehabilitation commission for retraining and placement at useful occupations. They are so in the habit of thinking only of treating the injury until healing has occurred that their minds do not function beyond that stage into the field of the patient's future usefulness. Or, if they do look into his future it is only with a sense of sorrow and pity for another victim of accident or disease.

Recently I witnessed the amputation of a leg by one of our best surgeons. The patient was a comparatively young man, a laborer, with a family. The surgeon said: "Poor fellow, he won't be able to go back to his usual work; he knows no other work; I wonder what will become of him and his family." This surgeon was surprised and gratified to learn that his patient could be referred to a state department where an artificial leg would be furnished him and where he might be trained for a new job.

In this case the amputation was done because of a disease not related in any way to his work; therefore, this patient was without employee's compensation. In our city, the charities or some other philanthropic organization can be found, which would finance this family during the period of the father's retraining for a new job. As yet the state law does not provide for maintenance during the period of training, and it is questionable whether this is advisable. The majority of these cases, however, can be trained for new work in some industry where they will receive some wage during training. In our community, workshops exist and others are being provided where the more serious cases can receive training and at the same time be paid wages, the money for this being obtained by the sale of fabricated articles plus one-half the weekly sum the charities would otherwise have to provide for

the maintenance of this family. The sum from the charities is paid direct to the workshop management rather than to the individual—the latter is thus unaware of the fact that he is receiving aid.

The following case which I have had under my care for the past two years illustrates how many of these cases may be handled:

F. K., aged 34, married, two children, lived in a small rented flat, employed as a fireman and engineer in a large office building. In February, 1922, an elevator which he was operating fell seven stories. Patient was brought direct to my service at St. Luke's Hospital suffering from backward dislocation of right knee, lateral dislocation of right patella, fracture and complete outward rotation of external condyle, fracture and complete displacement of internal condyle into knee joint cavity.

Treatment consisted of immobilization and traction in a Thomas splint with fomentations to joint for one week; reduction of dislocation under gas anesthesia with continued immobilization and traction in Thomas splint; operation two weeks later on external condyle, gas anesthesia, consisting of replacement of fragment and fastening of same to shaft of femur by ivory peg (I now use beef bone pegs); one week later, operation on internal condyle, gas anesthesia, replacing fragment in normal position as nearly as possible and holding same in position by drilling two holes each through shaft and fragment, threading kangaroo gut through these and tying in place.

This last operation was indicated because this internal condyle lay in such a position that weight bearing would be between the head of the tibia and this pointed fragment with ankylosis of knee bound to result.

This last operative wound became infected—*staphylococcus albus*. Bone developed in the capsule and tendons about the joint and even in the muscles—a condition similar to myositis ossificans. Two subsequent operations for drainage and removal of necrotic bone were necessary. A small discharging sinus has persisted in this case but is gradually healing.

Ordinarily this patient would be continued on weekly compensation of \$16.00 per week by the industrial commission until this wound had completely healed and then a settlement would be arranged based on the percentage of total disability. The healing of this wound may take two or three years. By the end of that time this patient would

be a confirmed loafer and pensioner. Too often have I seen the pitiful mental attitude of these long drawn out chronic cases.

During this patient's stay in the hospital he was given various forms of occupational therapy. Soon it developed that he had a natural inclination toward mechanics. This was fostered by talks with the patient, and by his reading, and ward occupations having a vocational trend. One year ago, when it was felt that patient could go about, returning twice or three times a week for dressings, the following arrangement was made:

The insurance company settled with patient for a loss of 25 per cent of his leg. Settlement at this time on existing condition would have been a 50 per cent loss, but I assured patient and the insurance company that this loss would be decreased one-half by time and further treatment. Patient also had eighteen months from time of this settlement to re-open case if my predictions of improvement failed. The insurance company guaranteed all further surgical care needed. This particular insurance company has grasped the ideals of rehabilitation.

Patient was then referred by me to the representative of the state rehabilitation commission with my recommendations for training in a practical course of mechanical engineering. This was arranged and patient was sent to the Armour Institute. After a short time he was given a part time job in the engineering department at Armour's plant and the remainder of the day was spent at the Institute. At present he is continuing his studies by practical full time employment at Armour's. Recently he was transferred to the draughting department. He received wages from the time he started at part time employment. At present he receives \$34.00 per week although he is still in training. The lump sum settlement he received from the insurance company was used as a part payment on a duplex apartment. Patient and his family live in one apartment and rent the other. He is keeping up his payments and making money in addition on his rent savings.

Recently this patient told me that his accident was a lucky thing for him. Before it occurred he was a satisfied laborer but now he is learning a good trade, owns his home and is making more money than he ever made before. This is the ideal of compensation expressed in terms of rehabilitation—not merely a pension over an indefinite

period, but a future compensation for the injuries sustained expressed in terms of a happier, more contented, more productive member of society.

Turning now to the second point in this paper, namely the application of reconstructive methods to all traumatic cases with a view of preventing or diminishing permanent deformities, traumatic neuroses and habits of idleness and dependency.

Recently a representative of a large casualty insurance company approached me with the proposition of doing their reconstructive surgery on their bad results from industrial surgery. My reply was that if they would do good reconstructive surgery from the beginning of the injury they would have fewer bad results and less need for a surgeon to do corrective work after the damage was done. Gradually most of our representative casualty companies are learning the lesson that the more expensive surgery in the first place is the cheapest in the long run.

During the last year there have been referred to me for reconstructive cure, that is, restoration of function, eight fractures in or near the shoulder joint, twenty-one cases of periarticular shoulder injuries, of from one month to three years' standing, including subdeltoid and subacromial bursitis, traumatic arthritis or periarthrititis, tearing off of the greater tuberosity, tendosynovitis of the long head of the biceps, et cetera, a constricting scar and an abscess of the shoulder joint.

In practically every one of these cases a careful review or backward look revealed the time or place when certain reconstructive methods if properly applied would have prevented or greatly reduced these permanent disabilities. The early and frequent use of the x-ray; the application of splints or traction in such a way as to prevent the stiff joints or the useless arm hanging at the side; the early use of physiotherapy; the developing of work habits early rather than waiting until months of hospital care was completed, are all methods of reconstruction which should have been applied as continuous treatment from the onset of the injuries instead of waiting until months later when the cases were referred for reconstructive surgery.

Reconstructive methods involve not only the proper diagnosis and proper early treatment of the injury, but certain adjuncts, properly applied, looking toward the early restoration of function and the redevelopment of work habits. This last point is very important in industrial accident cases be-

cause the weekly compensation plus the desire for a lump sum settlement for permanent disability, a desire frequently abetted by legal counsel, tends to keep many cases away from work for months or years.

These adjuncts are occupational therapy, physiotherapy, personal supervision of the application of these methods by the surgeon and stimulation of the patient to try active motion and effort on his own part. Again let me repeat that most of these methods can start within a few days after the accident instead of waiting until the permanent disability is more or less fixed before starting reconstruction. Therefore, reconstructive surgery is not limited to chronic diseases and deformities.

Occupational therapy is either diversional or purposeful. It consists of work of some type given to the bed patient (bedside occupation), to the patient able to sit up and go about the hospital (hospital work—shop occupations), and to the ambulatory case (either returning to the workshop at the hospital or to workshops established away from the hospital).

Diversional occupations serve chiefly in preventing the patient dwelling on his troubles, to make him more satisfied with his hospital sojourn and to reawaken an interest in his daily contact with life.

The surliest, most grumpish patient, complaining of the carelessness of his employer for allowing such an accident, complaining of the food and surroundings at the hospital, discontent with the treatment given, can often be changed into a contented, co-operative patient by persuading him to make a scarf for his wife on one of the little bedside looms utilized for this purpose. Work furnished one patient is often contagious and soon all the men in a ward will be doing some type of work. Before Christmas several of our men patients at St. Luke's Hospital were very busy making scarfs, selling them to the nurses and doctors for from \$2.00 to \$5.00 each.

Purposeful occupational therapy is the prescribing of some work which will tend to restore function in a member, as the use of a plane, a hammer, a saw or a gig-saw to teach the patient to grasp with or use stiff fingers, to loosen up a stiff ankle joint, et cetera. Another type of purposeful work is that which has a vocational trend, preparing the patient to take up vocational training for a new

occupation when his injury will prevent return to his old job.

The best type of occupational therapy, and the one hardest to sell to employers and to insurance companies, is to return the injured patient as soon as possible to light occupation in the plant or industry where he was formerly employed. Many an injured man, previously doing heavy, arduous work, must frequently wait months before his injury is sufficiently recovered to permit return to this heavy work. Such a one, shortly after he becomes an ambulatory case, could return to light work if his employer would co-operate and find a light job for him. It would be worth while for the insurance company to pay the wages of such a patient rather than continue to pay compensation over a period of months or even years. In the latter case this patient develops habits of idleness, becomes a pensioner, thinks constantly of a big settlement that will permit him to loaf the rest of his life or to start up in an easy business for himself and, abetted by his lawyer and family, he unconsciously endeavors to magnify his disability. Thus he becomes a traumatic neurotic case.

My experience prior to 1917, while serving as chief surgeon for a large industry, demonstrated the value of light work in the plant as the greatest form of occupational therapy and also as the best type of vocational training in many cases. Dr. Farnum, chief surgeon for the Avery Company, of Peoria, has for several years returned the majority of his fracture cases to light work within three weeks. Have you ever thought of the infrequency of traumatic neuroses among injured farmers, among business men or small store and shop keepers? These people when injured are forced to get back on the job just as soon as they become ambulatory cases.

This work, occupational therapy, is of great aid in reconstructive surgery and *must be applied early*. This idea must be sold to employers and to insurance companies if malingering and other forms of neuroses are to be reduced.

Physiotherapy, so sadly neglected by our profession prior to the war, enriching the armamentarium of all forms of quackery, has again become a recognized therapeutic agency since the war. Every hospital receiving and treating traumatic cases should have a trained physiotherapy aid to give massage, passive and active motions, hydrotherapy and function restoring exercises to such cases, under the

direction of the surgeon; and the same should be started just as early in the course of treatment as compatible with healing of the injury.

Heat is one of the best therapeutic agents. It can be applied as continuous hot fomentations, by the Burdick electric baker, by diathermy or other forms of electro-therapeutics. Elaborate apparatus is not necessary for the early treatment of injury cases. When the joint has become stiff or a member has been allowed to lose its range of motion, too often the stage reached before cases are referred for physiotherapy, then more elaborate apparatus and more prolonged daily treatments are required.

Physiotherapy misapplied, or too strenuous physiotherapy, can be detrimental to a case, increasing the permanent deformity. Again, unless carefully guarded it can slide over into the realm of quackery. Many surgeons doing chiefly industrial accident work have installed quartz lights, Burdick bakers and other forms of apparatus. Several insurance companies have put in physiotherapy units in connection with their claim departments and have employed doctors and nurses to treat chronic disabling conditions after the surgeon has completed the acute treatment. In many cases good results are obtained but too often recovery is delayed indefinitely. For example:

Recently I saw a man who had not worked for four months because of an injured shoulder. History showed that he had been carrying one end of a heavy plank on his shoulder when it slipped off and he caught it with his hand, thus giving his entire arm and shoulder a severe jerk and jar. He had been treated in the office of a doctor whose work was limited to insurance cases. Every day he went to this office and the nurse put a lamp over his shoulder and baked it for twenty minutes, followed by massage. Complaints on this date of examination were very indefinite and amounted to this: "I can't use it." Examination showed no swelling, variable points of tenderness, complete range of motion, and over the shoulder variable points of alleged anesthesia. The x-ray examination was negative. There was absolutely nothing wrong with the shoulder. He had developed a neurosis, which was gradually passing over into the realm of malingering.

When told that there was nothing wrong with his shoulder and that he could use it, he replied: "There must be something wrong with it or the insurance company wouldn't have paid me all these

weeks and the doctor wouldn't have treated it every day." Thus the daily, easy application of a routine type of physiotherapy had allowed this case to drift into a traumatic neurosis.

Another case, recently seen, sprained his ankle, was sent to the insurance company, ankle strapped and placed under the Burdick lamp for this form of physiotherapy. He reported for daily treatments for three weeks, walking on the foot every day. Because he complained that ankle was becoming more painful, he was referred for treatments. An x-ray was taken before treatments were given, which showed a transverse fracture of the fibula without displacement. These examples and scores of others are convincing evidence that there must be an intelligent surgical sense directing the application of physiotherapy, otherwise it becomes a form of quackery.

Intelligent, carefully directed occupational therapy and physiotherapy after the case has become convalescent and able to be away from the hospital is equally essential for rapid recovery and restoration of function. A good physiotherapy laboratory, directed by a skilled medical man, co-operating with the surgeons who have treated the cases, is the best means of meeting the reconstructive problems during the period between hospital treatment and return to work. Because the surgeons have paid so little attention to this period of treatment, simply telling the patient to have some member of the family massage the part, a great many of these cases have drifted into the hands of the osteopaths and chiropractors. Many of these irregular practitioners have installed physiotherapy appliances and are tending to keep these methods in the field of quackery. Dr. John Coulter, working in his physiotherapy institute in Chicago and in the physiotherapy laboratories at Central Free Dispensary and Cook County Hospital, has well demonstrated that this is a scientific field belonging absolutely to the realm of medicine and surgery.

Out of the great variety of deforming conditions following trauma that have been referred for reconstructive surgery, I have chosen shoulder joint injuries to illustrate the early application of reconstructive methods with a view of preventing deformities.

Of all joint injuries referred to me for treatment, those of the shoulder joint are by far the most common except the aggravating and numerous conditions developing about the lumbar and sacro-iliac

regions. Lovett, Codman, Magnuson and Coulter and the older writers, Von Bergman, Thiem, Dittmar and others, all say in substance, "probably no other joint is so frequently injured and gives such consistent trouble as the shoulder." I would add to this that probably no other joint when injured is so consistently mistreated as the shoulder.

Von Bergman* quotes Dittmar as follows: "Of twenty-eight cases of sprain of the shoulder, only five were cured by an average treatment of 9.4 months; after 13 months in twenty-three cases there was still an average disability of 21.4 per cent." One is startled by the lengths of treatment mentioned, nine and thirteen months, for in this day of employees' compensation and of insurance companies urging rapid recovery, few surgeons persist in such long periods of treatment. Rather they tend to discharge the case before recovery is complete, assigning the lack of full restoration of function to a traumatic neurosis or malingering. One wonders, however, in reading Von Bergman's treatment of shoulder injuries if the lack of that essential factor in treatment, *the immobilization of the arm at a right angle abduction*, did not influence the prolonged period of treatment.

In shoulder joint injuries there are a few essential points in anatomy, diagnosis and treatment which every surgeon treating these cases must constantly bear in mind.

ANATOMICAL POINTS

1. There are twelve muscles passing over and around the shoulder joint and involved in its movements which can be divided into a *Strong Group* and a *Weak Group*.

The *Strong Group*, chief of which are the pectoralis major, the latissimus dorsi, subscapularis, teres major and triceps, form the strong adductors and internal rotators of the arm. The *Weak Group*, chief of which are the deltoid, the supraspinatus, infraspinatus and teres minor, form the less powerful abductors and external rotators of the arm.

2. The arm hangs vertically at the side in the position most naturally assumed by gravity. Overcoming this force of gravity becomes a most important factor when muscles long unused and atrophied, therefore weakened to a still greater extent, must again take up the burden of abducting and elevating the arm.

3. Surrounding this joint are numerous anatomical parts which may be involved in injury and

interfere greatly with joint function. Thus are found numerous bursæ; many tendons, one of which, the long head of the biceps, has a sheath communicating with the joint proper; tuberosities and other bony prominences which may be torn off by direct violence or severe tendinous pull; a scapula which must be fixed for certain joint movements and must be freely movable for others; nerves and blood vessels in the axilla which frequently are involved in injury, and glands in the axilla that make this a common site for infections with resulting scars that may interfere in function.

DIAGNOSTIC POINTS

1. No joint in the body has so many parts intimately related to it as the shoulder joint. Injuries may involve several of these parts; in fact, in severe trauma it is seldom that only one of these parts is involved. Thus, a fall on the outstretched arm or a direct blow to the shoulder may cause a bursitis, a contusion of the joint surfaces and a chipping fracture of the margin of the glenoid fossa. Every part involved in the trauma must be diagnosed and considered.

2. X-rays of the simplest injuries of the shoulder joint are indicated. No dislocation of the shoulder should be reduced without first having an x-ray examination because too often a fracture of the anatomical neck of the humerus simulates perfectly a dislocation; too often a small chipped fracture of the glenoid margin complicates the dislocation or some other bone injury complicates it and means, if unrecognized, a permanently disabled shoulder joint.

If the first x-ray fails to show pathology and yet the symptoms persist, a second x-ray, two or four weeks later, often shows the calcareous deposits in a subdeltoid or subacromial bursitis, a roughening of the head of the humerus or deposits in the joint indicating a traumatic arthritis, or other slowly developing pathology. Time and again a shoulder joint case is referred to me with the statement that the x-ray, taken at time of injury, was negative. The case is usually called a neurosis, and when I take a second x-ray, the real pathological condition is very apparent, to the chagrin of the physician referring the case.

3. Failure to test the nerve sensations about the shoulder joint often accounts for failure to diagnose a nerve injury as the cause of the prolonged disability—as a circumflex nerve injury.

*System of Practical Surgery, Vol. III. H. C. W. B. Co.

4. Persistent pain about the shoulder in the absence of all findings, frequently called neuritis, can often be accounted for by an x-ray of the cervical vertebrae showing an osteoarthritis as the cause.

TREATMENT POINTS

1. The first essential in treating all injuries of the shoulder joint is to protect as far as possible the weaker group of muscles, the abductors and external rotators; and to prevent contraction of the stronger group. This is accomplished by holding the arm at or a little above a right angle abduction and in partial or complete external rotation during the period of complete or partial immobilization. This can be done best by the use of a cast or by means of extension and pulley apparatus with the patient in bed, or in selected cases by some one of the airplane splints, preferably the Crane-Savenay splint.

2. Ninety per cent of the persistent disabilities of the shoulder joint are due to immobilizing the arm at the side of the body in partial or exaggerated adduction position. In young people or in certain dislocations of the shoulder joint, with only a week or ten days' immobilization before use of the arm is allowed, such a fixation may not be disastrous. But in people past middle age adduction fixation for any length of time on account of dislocation, fractured clavicle, fractured humerus or injuries in or about the shoulder joint, is absolutely contraindicated.

Try to raise the arm of an old man who has had it fixed in adduction position continuously for two weeks and note the contraction of the anterior fold (pectoralis major) and of the posterior fold (latissimus dorsi) of the axilla. Note the flabby weakened condition of the deltoid and supra spinatus. Every additional day that the arm is in adduction fixation this contraction becomes more marked and the weak abductors become less powerful.

3. If the joint has been injured so that there is danger of infection; if an arthritis or peri-arthritis is present; if a bursitis, which is only another form of peri-arthritis, exists, then the joint surfaces must be prevented from becoming adherent, or of pressing on each other, or contraction of the soft tissues or capsule about the joint must be prevented. This is accomplished by traction on the arm while the latter is held in abduction. The best means to do this is with a Thomas arm splint.

A point I have recently learned from experience is to apply my traction to the upper arm, leaving the elbow joint free to move at will.

4. Early passive motion should be started in these joints as soon as compatible with healing of soft tissues or fixation in case of a fracture. Very slight passive motion can be started within the first week. Active motion must be instituted gradually and gently. Recently I saw a surgeon illustrate the use of early active motion in a fractured head of the humerus. The case had been treated excellently, but on this date, four weeks after injury, he forcibly raised the arm above its right angle fixation and rotated it. The patient complained of pain bitterly, but the surgeon insisted that early force was necessary. Never under any condition exert active or passive motion to or beyond the pain point. Early motion to the prepain point is good; beyond that you run grave risk of starting an arthritis which will undo all the benefits of a properly conducted early treatment.

5. The application of hydrotherapy in the form of large hot fomentations is always beneficial in these injured joints; likewise baking of the joint by a Burdick baker. Diathermy, or deep baking of the joint, is indicated in the later stages; early it may create too great a reaction. Massage, gentle at first and gradually increasing, but never to the painful point, can go hand in hand with passive and active motion.

The measures outlined above relate to the early treatment of shoulder joint injuries instituted with a view of preventing the permanent disabilities so commonly following these injuries. They are practically the same measures adapted to the reconstructive treatment of old disability cases referred for the purpose of restoring function in a shoulder joint. Applied early they hasten recovery without the usual prolonged period of disability necessary to regain use of the arm. Applied late, after true or false ankylosis has occurred, they require perhaps operative treatment and months of abduction treatment, physiotherapy and all the other reconstructive efforts, and even then too often fail in their purpose.

In almost every type of deformity there are reconstructive principles and methods which will improve or restore function. The early application of these methods in the surgery of trauma will prevent a vast majority of these deformities.

SOME POINTS ON THE INNERVATION OF THE CHEST*

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REFERRED PAIN

The importance of knowing the fundamental nerve supply to the chest is especially evident when one attempts to work out the mechanism involved in referred pain and the reflexes which arise from irritation of the deeper structures of the body. It may be well, then, first to review briefly the general neuro-anatomy underlying these phenomena.

General plan of a typical thoracic spinal nerve and connections with the sympathetic system.—As you recall and as again illustrated in Figure 1, a typical spinal nerve gives off three branches just peripheral to the ganglion as it leaves the intervertebral foramen or very shortly thereafter. The first of these is a small twig called the recurrent nerve, which supplies the meninges about the spinal cord. The next branch is the dorsal (posterior) primary division of the nerve, which goes to the back muscles and overlying skin. The third is a rather delicate one called the ramus communicans, but which ought to be termed the *visceral ramus*, because it carries impulses from the spinal cord to the viscera and from the viscera to the spinal cord and to the other branches of the spinal nerve. If these simple facts, as illustrated in Figure 1, were kept in mind, the horror some physicians have for the sympathetic nervous system would largely disappear. At least the great bulk, if not all, of the sympathetic ganglion cells may be regarded merely as efferent (motor and secretory) neurones which have not remained in the gray matter of the central nervous system but have migrated out nearer the structures to be innervated, necessitating nerve fibers (preganglionic) for the purpose of carrying impulses from the central nervous system to these outlying motor and secretory nerve cells (Fig. 5), just as lower centers within the central nervous system are related to descending tracts from higher centers. The clearest presentation of this subject will be found in Gaskell's³⁵ book on the involuntary nervous system.

The only visceral afferent fibers which have been definitely identified merely course through these sympathetic ganglia and connecting plexuses without having any direct connection with the sympathetic ganglion cells and fibers coming from them. There is still some uncertainty about the terminal sympathetic plexuses; but in the main if you limit the term "sympathetic" to mean only sympathetic ganglion cells and the fibers which they produce,

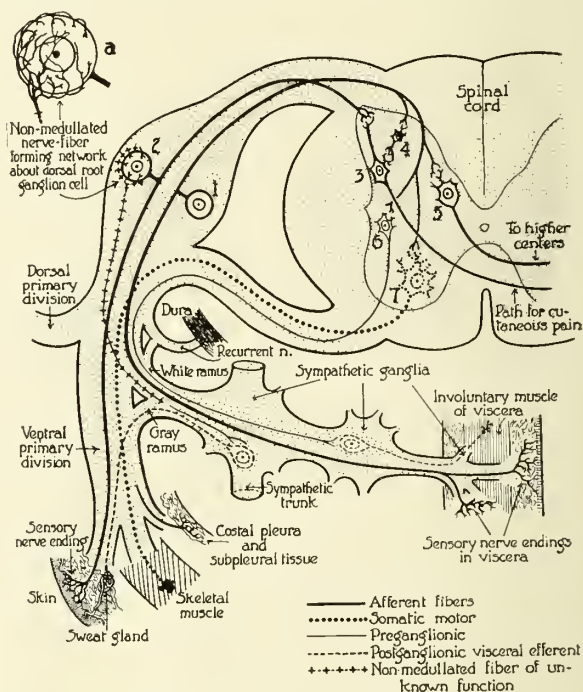


Fig. 1.—Diagram of a typical thoracic spinal nerve and connections with sympathetic ganglia: 1, visceral afferent neurone (of first order); 2, cutaneous sensory neurone (of first order, related pericellular basket shown in greater detail at a); 3, neurone of second order in the pain tract from the skin; 4, association neurone which under lowered threshold of irritability might conduct visceral sensory impulses to the cutaneous pain tract; 5, neurone of the second order in the visceral afferent path; 6, visceral efferent (motor) neurone carrying impulses out of the central nervous system to sympathetic ganglia; 7, somatic motor neurone carrying efferent impulses directly out to voluntary muscles. Further explanation in the text.

the sympathetic nervous system is motor and secretory and the two subdivisions, autonomic or parasympathetic on the one hand and sympathetic proper (Fig. 5) on the other, are terms which apply only to this efferent mechanism and not to the visceral sensory fibers that happen to follow along with them.

Each ramus communicans is usually divisible into two strands. One of these, the white ramus, is largely composed of medullated fibers consisting of large visceral afferent and finer preganglionic or visceral efferent fibers. The other bundle, the gray

*Read by invitation before the Medical Staffs of the Parkview Sanatorium and the Lymanhurst School for Tuberculous Children, November, 1923.

ramus, is a sympathetic nerve in the strictest sense, composed almost wholly of non-medullated fibers destined for plain muscles and glands best reached by following along (and becoming mixed with) the main branches of the spinal nerves that go out to all parts of the body wall and limbs.

The main trunk of a spinal nerve (ventral or anterior primary division, shown diagrammatically in Figure 1) proceeds laterally and ventrally, supplying peripheral branches to the skin, musculature, costal pleura, etc.

From the above it is evident that afferent impulses from a particular viscus may enter a region of the spinal cord that also receives sensory impulses from a cutaneous area that is supplied by spinal nerves arising from that same region of the cord.

Theories of referred sensations.—Why a hyper-sensitive cutaneous area with actual pain develops as a result of irritation of some organ quite remote from the skin has been explained in various ways. The general idea is that there is a spreading of the impulses beyond the normal paths of conduction into tracts which ordinarily convey only impulses from the skin. Just where this spreading takes place is not clear.

One idea is that the non-medullated fibers which form a pericellular basket about dorsal root ganglion cells, as shown at 2 and in more detail at a in Figure 1, have been stimulated by the irritation and then transfer the impulses to a neurone whose peripheral process terminates in the skin. Central conduction would hence be the same as if the seat of the irritation were in the skin. But the fibers thus terminating as pericellular baskets in the dorsal root ganglia have never been shown to carry such impulses nor even to be visceral afferent.

A second theory is that the excessive stimulation of visceral afferent fibers lowers the threshold of irritability in the central nervous system so that impulses spread into pathways usually only involved in cutaneous stimulation. This can be readily understood by referring to Figure 1. Normally the resistance at the synapse between the visceral afferent fiber (neurone 1) and neurone 4 is so high that the path of conduction is to neurones 5 and 6; but if the resistance in the path involving association neurone 4 is greatly reduced, impulses may stray to neurone 3 and thence to the conscious center for cutaneous pain just as if the impulse originally started in the sensory fibers of the skin. Or

the lowered threshold may result in impulses ascending much higher than normally but over already existing tracts. Due to lack of experience in accurately locating the seat of visceral excitation, it is falsely located in the skin connected with the particular region of the central nervous system especially closely associated neurally with the irritated viscera.

The third and least plausible explanation is that during central conduction of visceral afferent impulses, say over neurone 5 in Figure 1, the impulse spreads into an adjacent bundle of fibers, as those from neurone 3 of Figure 1, which regularly are conducting impulses from the skin. For further discussion of this subject reference may be made to Head's article listed at the end of the paper.³⁹

Example of referred sensations.—The best example of referred sensations to illustrate the involved neurology is in connection with the diaphragm. As shown in Figure 2, the central portion of the diaphragm is supplied with sensory fibers by the

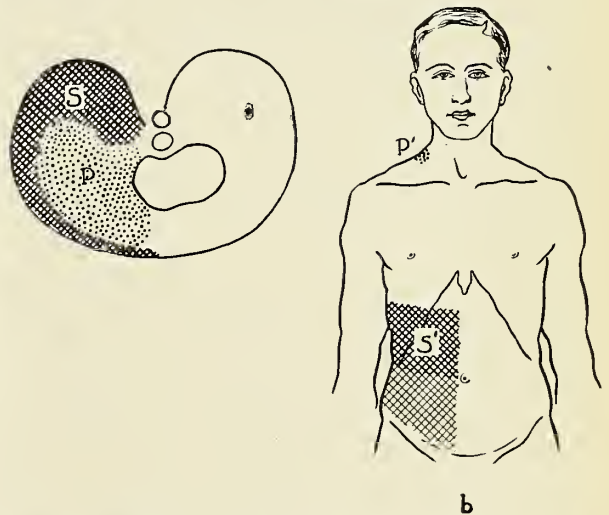


Fig. 2.—Diagram showing where pain is referred as a result of stimulating various areas on the diaphragm. a, Surface view of diaphragm; b, cutaneous areas to which diaphragmatic pain is referred. When area P is irritated the pain is located at P'. When area S is irritated the pain is referred to S'. (Modified from Capps.)

phrenics which are branches primarily of the fourth cervical nerves. The rim and posterior third, however, is supplied by the lower six thoracic nerves. Cope²¹ has definitely shown that if the phrenic region is irritated the sensation is referred to the trapezius region where the skin is supplied by the fourth cervical nerve, whereas if the periphery and posterior portion of the diaphragm is stimulated the sensation is referred to the lower chest and

upper abdominal wall, i.e., to the cutaneous region supplied by the lower thoracic nerves. .

SUMMARY OF THE NERVE SUPPLY TO THE CHEST OF INTEREST TO CLINICIANS

The costal portion of the parietal pleura.—The costal pleura is supplied by the deeper branches of the intercostal nerves. It is sensitive to painful stimuli, but not to ordinary touch and temperature (Capps,¹⁵ Hoffmann⁴¹). The pain is of the usual irritation type characteristic of peripheral nerves. It is located fairly accurately over the particular intercostal nerve involved, although localization is more accurate in the ventral and lateral regions than in the dorsal.

The diaphragm.—The phrenic nerves are the chief if not the sole motor supply to the diaphragm as is evident from the paralysis resulting from their complete severance. Blocking the phrenics with novocain has been done for relief of severe attacks of singultus (Wegele⁴²), while Báron³ has done it to stop coughing due to injury to the diaphragm. Neuhöfer⁶¹ recommends phrenicotomy under certain other conditions where immobility of the diaphragm is desirable. A number practice it as an aid in curing pulmonary tuberculosis (Alexander,¹ Goetze,³⁷ Frisch³⁴ and others). Some indications and results of radical phrenicotomy have recently been published by Fischer.³³

The afferent supply of the diaphragm, as has already been mentioned in connection with referred sensations, is by the phrenics and lower six thoracic spinal nerves. The reason for this dual arrangement is embryological. The central portion of the diaphragm arises from the septum transversum, which descends from the cervical region, carrying its cervical (phrenic) nerve supply with it. The periphery and dorsal portion comes from folds arising from the adjacent body wall where the lower thoracic nerves are involved.

The phrenic nerves, however, supply afferent fibers not only to both surfaces of the central and greater portion of the ventral two-thirds of the diaphragm but also to the capsule and ligaments of the liver and structures in the suprarenal region of the abdomen. Cope,²¹ Orr,⁶³ Westphal⁸³ and others have recently called attention to the diagnostic value of phrenic shoulder pain in acute abdominal diseases that affect the hepatic, gastric, pancreatic and upper renal regions. Thus a point of tenderness in the neck over the right phrenic may be sig-

nificant in Weil's disease (acute febrile jaundice), inflammation of the biliary tract, enlargement of the liver with stretching of the capsule, as well as diseases involving the right side of the diaphragm. Air injected into the abdominal cavity, if allowed to rise to the diaphragmatic region, produces phrenic shoulder pain.

Lungs and deep air passages.—The motor nerve fibers to the bronchial musculature arise largely from the sympathetic nerve cells of the pulmonary

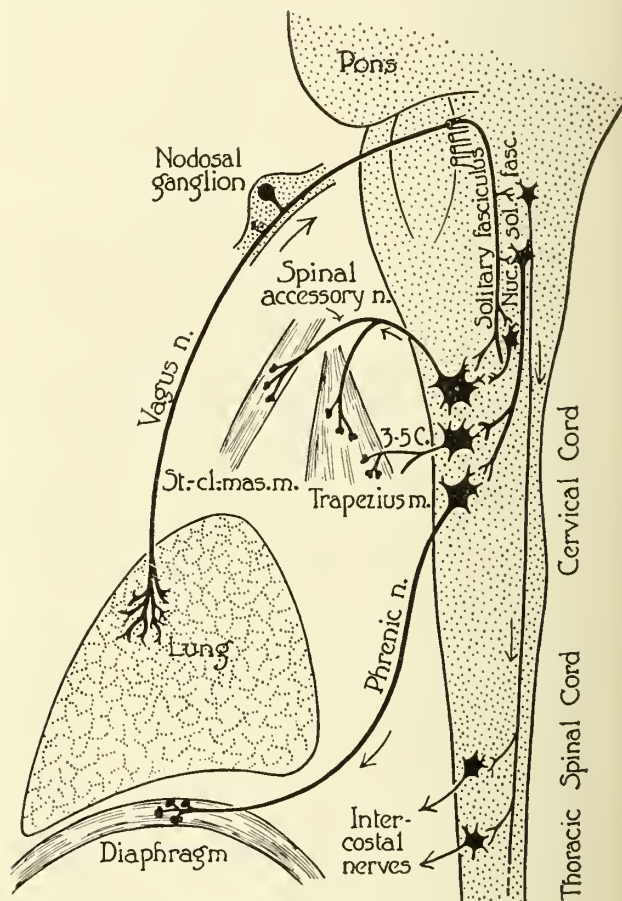


Fig. 3.—Diagram showing the probable reflex arc from the lungs over the vagus nerve to the cervical and thoracic region of the spinal cord and out to the sternocleidomastoid, trapezius, diaphragm and other muscles.

plexus outside of the lungs, but also to some extent from ganglion cells scattered along the larger bronchi, particularly as far as the origin of bronchi of the third order. These ganglion cells in turn are connected mostly with fibers from the homolateral vagus and to a slight extent with either the contralateral vagus or upper thoracic spinal nerves and sympathetic chain (Larsell,⁴⁹ Larsell and Mason⁵¹).

The bronchial mucous glands are apparently innervated by the same source as in case of the musculature.

The vasomotor nerves to the blood vessels of the lung are derived largely from the second and third thoracic sympathetic ganglia of the main sympathetic trunk (Fig. 5) (Möllgaard,⁵⁹ Larsell and Mason⁵¹). Luckhardt and Carlson,⁵³ however, found vasoconstrictors to the lungs in the vagus of frogs and turtles. In the turtle the vagus also contains vasodilators to the lungs. Evidently there may be variations in the vasomotor mechanism in animals of different species.

Afferent nerves and sensory endings are found in the epithelium of the primary bronchi and at the point of bifurcation of the succeeding order of bronchi nearly to the alveolar duct, in the muscles of the bronchi and in the walls of the larger pulmonary arteries (Larsell,^{48, 49, 50} Dogiel²⁶). The bronchoscope and even more slender instruments inserted deeply in the respiratory passages may pro-

particular lung when the corresponding vagus is cut (Larsell and Mason,⁵¹ Larsell⁴⁹), indicating that they come largely from the homolateral vagus. The rest come either from the opposite vagus or

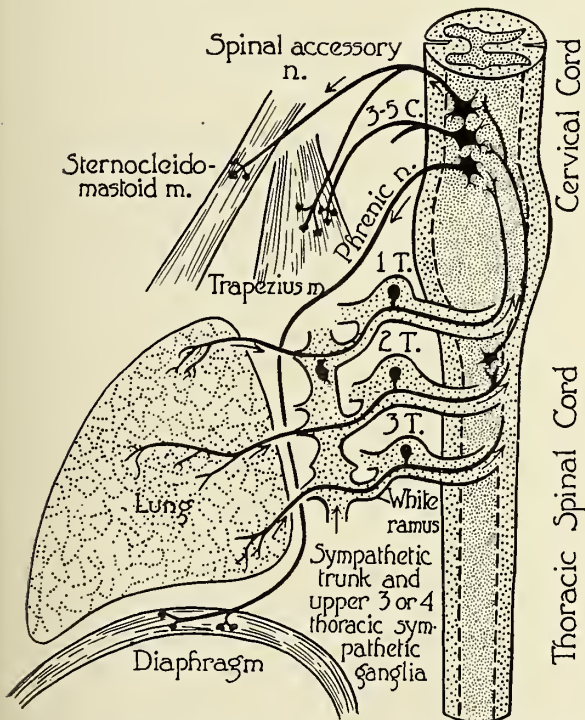


Fig. 4.—Diagram showing another probable reflex path from the lungs to the sternocleidomastoid, trapezius and diaphragm as a result of irritating the afferent fibers from the upper thoracic spinal nerves.

duce coughing (Jackson,⁴² Larsell⁵⁰), although the more distal portion of the respiratory tree is less sensitive than the trachea and primary bronchi.

Most of these afferent nerves degenerate in a

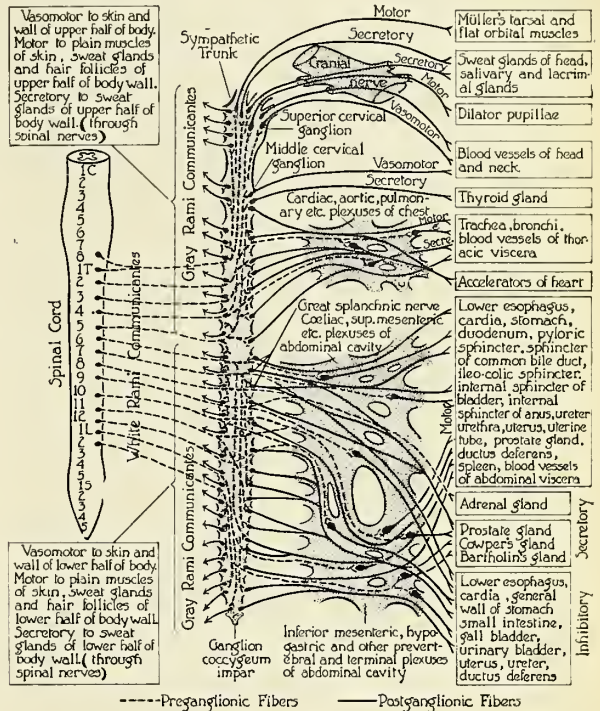


Fig. 5.—Diagram of the so-called sympathetic system proper (thoracic-lumbar outflow of general visceral efferent fibers) showing the functional significance of the sympathetic trunk and its connections.

from the upper thoracic nerves through the sympathetic system as shown in Figure 4. Stimulation of the deep air passages with irritating gas modifies respiration even after sections of both vagi (Craigie²²) and Pike and Coombs^{65, 66} have shown that respiratory movements are markedly disturbed when the dorsal roots of the thoracic nerves are cut. These experiments emphasize the importance of these afferent fibers in the spinal nerves.

The central connections of the afferent fibers of the vagus are diagrammed in Figure 3. This cut was designed to show the probable neurological basis for the referred pain in the cutaneous region of the fourth and adjacent cervical nerves resulting from lung disturbances and the spasticity of the trapezius, sternocleidomastoid and diaphragm in tuberculosis of the lung (Pottenger⁶⁸). Another possibility is shown in Figure 4, although since most of the afferent fibers from the lungs (exclusive of the pulmonary pleura) are vagus in origin,

the first pathway (Fig. 3) is probably the most important.

Pulmonary pleura.—In contrast to the rest of the lung, the pulmonary pleura is supplied with afferent fibers largely, if not entirely, from the upper three or four thoracic spinal nerves (especially the second and third). These course through the white rami into the sympathetic trunk of the upper thoracic and lower cervical region, leaving the trunk in the neighborhood of the inferior cervical sympathetic ganglion (Edgeworth,²⁹ Möllgaard.⁵⁹ Ranson and Billingsley,⁷¹ Hoffmann,⁴¹ Larsell⁴⁹). They course in the periarterial plexus along the pulmonary artery. Larsell finds that these nerves are confined to the margins of the interlobular regions and are most numerous in the dorsal margins near the hilus of the lung. They terminate in sensory endings of various types. Large areas in contact with the parietal pleura are practically devoid of nerves. This accounts for the general findings that the surface of the lung is insensitive to mechanical and chemical stimuli (Capps¹⁵), although Hoffmann⁴¹ found a small area near the hilus of the lung that seemed sensitive, as one would expect from the presence of sensory nerves especially in this region. Electric stimuli may be perceived and cold (20° C.) and warmth (50° C.) cause coughing when applied to the visceral pleura. Pain is aroused only when adhesions are present, evidently because the parietal pleura becomes involved. A more careful examination of the special regions where there are sensory nerve fibers is needed.

Mediastinal or pericardial pleura.—Capps'¹⁵ experiments on human subjects indicate that the phrenic supplies the pericardial pleura. Its irritation causes referred pain in the fourth cervical cutaneous region as in irritation of the central portion of the diaphragm and upper abdominal tissues, which are also supplied by the phrenics.

The pericardium.—This membrane is also largely supplied with afferent fibers from the phrenics, although cutting these nerves does not entirely abolish the rise in blood pressure produced by stretching or pinching the pericardium. Hence some afferent fibers evidently come from the thoracic spinal nerves via the sympathetic system (Luschka,⁵⁴ Ramstrom,⁶⁹ Capps,¹⁵ Mathieson⁵⁶).

Heart and great vessels.—Time will not permit any detailed statement of the motor nervous mechanism of the heart. The presence of intrinsic gan-

glion cells and their fibers more or less diffusely scattered as well as in groups near and within the sinoatrial node of Keith and Flack, the atrioventricular node and its continuation, the atrioventricular bundle of His, is generally recognized. These ganglion cells send fibers to the cardiac muscle cells. They receive a rich supply of pericellular nerve endings (preganglionic fibers) mostly of vagus origin.

These extrinsic nerves from the vagus are inhibitory and arise, according to Malone,⁵⁵ from the middle portion of the cell column in the medulla oblongata known as the dorsal nucleus of the vagus. Eyster and Meek³¹ have obtained good evidence that the vagus normally exerts its greatest influence on the sinoatrial node, next upon the atrial portion of the atrioventricular node and still less upon the ventricular portion of the latter node. Bachmann² has described in considerable detail the distribution of each vagus within the heart.

The accelerator nerves leave the upper thoracic region of the spinal cord as small medullated fibers which pass through the ventral roots and white rami of the upper three or four thoracic nerves and into the sympathetic trunk, where most of them terminate about the cells of the upper thoracic and lower and middle cervical sympathetic ganglia (Fig. 5). The cardiac accelerator nerves arise from these ganglia and in connection with the cardiac fibers from the vagus form the cardiac and coronary plexuses.

A few preganglionic accelerator fibers do not end in the sympathetic ganglia of the main trunk as just described, but continue on to the cardiac ganglion of Wrisberg located in the superficial cardiac plexus. The postganglionic non-medullated fibers terminate in distinct endings on the cardiac muscle cells.

The vasomotor supply to the coronary vessels and aorta is from the upper four or five thoracic sympathetic ganglia, although there is some evidence that vagus irritation may cause spasms of the coronary arteries, thus indicating some vasoconstrictor fibers in this nerve. Langendorff (see Higier⁴⁰), from experiments with adrenalin, concluded that the most evident effect produced by the thoracic sympathetic ganglia on the coronary vessels is dilatation.

Afferent nerves and nerve endings are abundant in the heart (Dogiel,²⁷ Smirnow,⁷⁹ Valedinsky,⁸¹ Michailow⁵⁷). Some of these fibers are from the

vagus. A special bundle to the aorta, usually designated as the depressor nerve, is of importance because the claim has been made that this can be isolated and cut with some success for the relief of angina pectoris of basal aortic origin. The rôle of the depressor nerve in slowing the heart and relaxing the arteries is well known.

Many of the afferent fibers to the heart come, however, from the upper thoracic spinal nerves, mostly over the upper three or four white rami communicantes (Ranson and Billingsley⁷¹). Clinical evidence indicates that they come mostly from the left side. Daniélopou²³ found that he could relieve most of the pain in angina pectoris by cutting the dorsal root of the second thoracic nerve on the left side. In diseases of the ventricles and ascending aorta the pain is usually referred to the left upper thoracic and left third and fourth cervical cutaneous areas, although it may spread to the right side (Pottenger⁶⁸). This is also evidence that the ventricles and base of aorta are closely connected by afferent nerves with the gray matter of the upper thoracic and mid-cervical region. Similar evidence shows that the atria are connected with the thoracic cord as low as the seventh thoracic segment. The pain in mitral stenosis with dilatation of the left atrium, for example, is referred mostly to the sixth and seventh thoracic cutaneous segments. Since the atria of the heart are derived from the venous or caudal end of the embryonal heart, the connection of the atrial portion with a more caudal region of the spinal cord is to be expected.

That these spinal fibers traverse the lower cervical and upper thoracic regions of the sympathetic trunk is supported by the relief afforded by surgical removal of these portions of sympathetic chain as has been done by Jonnesco⁴³ and others (Coffey and Brown,¹⁹ Brown,⁹ Brünig¹¹) in angina pectoris due to aortic and cardiac lesions.

Esophagus.—The literature on the nerve supply to the esophagus has recently been exhaustively reviewed by Carlson.¹⁷ His own experiments confirm the idea that the vagus has both motor and inhibitory control over the esophagus and cardia. If in strong tonus, vagus stimulation causes inhibition and if relaxed the same stimulus causes contraction.

Contrary to the general notion that the splanchnic nerves have nothing to do with this region of the alimentary canal; Carlson found that in the cat the same results may be obtained by splanchnic stimu-

lation as is obtained by stimulation of the vagus. In the dog only contraction resulted, while in the rabbit only inhibitory effects were obtained from stimulating the splanchnics. Adrenalin produces both contraction and inhibition, depending upon the state of tonus at the time.

On the whole, it is necessary to assume that both the vagus and the splanchnic nerves innervate the thoracic portion of the esophagus and the cardia of the stomach. This is one more instance where the antagonism generally assumed to exist between the parasympathetic (or autonomic) and sympathetic system proper has been shown to be at least greatly overdrawn.

The sensory properties of the esophagus has been most intensively studied by Boring.⁶ His results show that the mucous membrane throughout its entire length is sensitive to thermal, mechanical, chemical (alcohol and hydrochloric acid, but not to oil of peppermint nor mustard and pepper suspensions) and electrical stimuli; 60° C. gives sensations of heat, and extreme cold and heat cause pain. The upper esophagus is more sensitive than the lower portion. When the thoracic portion is excited with electrical stimuli by a small active electrode sensations are first noticeable in the arm where a large indifferent sponge electrode is applied, although this indifferent electrode covers more than fifty times as much surface as the small active electrode covers in the esophagus.

The sensations from the esophagus are generally referred too low over the lower third of the sternum and middle region of the upper half of the epigastrium when the lower third of the thoracic esophagus is stimulated. When the upper third of the thoracic esophagus is stimulated the sensations are more accurately located but usually too high and frequently in the throat region.

The afferent nerves involved are largely supplied by the vagus. The lower portion at least receives some fibers from the splanchnics (fifth to tenth thoracic spinal nerves). This explains the reference of the sensations from this region of the esophagus to the epigastrium.

The thymus.—While nothing specific can be said of the functional significance of the nerves to the thymus, the chief anatomical findings show that there are fine non-medullated nerves around the blood vessels and in the connective tissue of the capsule and trabeculae. Sympathetic fibers from the upper thoracic and cervical sympathetic chain,

in connection with small filaments from the vagi, descend along the thyroid gland, cardiac nerves and thymic blood vessels into the gland. Occasionally some of these fibers follow the phrenic nerves for a distance (Braeucker⁸).

Apparently the thymus is insensitive to ordinary stimuli, but when inflamed it produces pain which is poorly localized. This pain may in some cases be due to encroachment upon neighboring structures such as the great vessels, lungs, phrenics, vagi, recurrent, laryngeal nerves, etc. (Phillips,⁶⁴ Lemon⁵²).

The thoracic sympathetic trunk.—In connection with chest diseases, attention may finally be called to the possibility of involvement of the sympathetic trunk and related nerves, since they lie just under the parietal pleura through the greater portion of the thoracic cavity. Figure 5 gives some idea of the functional significance of this great system. It is a relay mechanism between most of the viscera of the entire body on one hand and the central nervous system on the other. The anatomical connections between the sympathetic trunk and the spinal cord are the white rami communicantes, which are limited to the thoracic and upper two or three lumbar segments, that is, almost wholly in the thoracic region. That many visceral disturbances might be brought about by the encroachment of chest abnormalities upon this system is thus apparent. Dilatation of the pupil due to pressure on the sympathetic trunk is a common example; however, this may occur from trauma to peripheral nerves in many other parts of the body (Byrne^{12, 13, 14}).

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PRELIMINARY NOTE: A STUDY OF THE
NERVOUS SYNDROME AND THE BLOOD
SERUM IN PERNICIOUS ANEMIA AS AN
AID IN DIAGNOSIS BEFORE RECOGNIZ-
ABLE CHANGES ARE APPARENT*

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In 1896 I reported a case of pernicious anemia¹ before the American Neurological Association at Philadelphia. The pathological findings were carefully worked out by Dr. Louis B. Wilson. The first contribution to this subject in this country was made by Putman in January, 1891. Three months later Dana reported a case; his second case was reported in 1899. My case with the neuropathological findings is the third in American literature. In 1913,² I read a paper before the nervous section of the A. M. A., at Minneapolis, on "Some Nervous Symptoms of Pernicious Anemia." I emphasized the great importance of these symptoms, stressing their distinctiveness, especially the subjective sensory disturbances; their constancy, their progressiveness and their early appearance. I stated that the symptoms may resemble those observed in peripheral multiple neuritis. I intimated that the sclerosis was apparently of vascular origin and might precede by months or even years the appearance of the blood picture. I illustrated this by reporting a case of Bramwell in which the cord symptoms preceded by three years the blood picture which two weeks before death showed no characteristic features of pernicious anemia. I also stated "that the personal equation determines whether the pathologic process be a pernicious anemia with or without a cord lesion or simply a diffuse degeneration of the spinal cord." "It occurs to me," says Dr. Woltmann,** "that patients may die of neurologic changes without ever developing anemia and yet have the same disease fundamentally that we refer to as pernicious anemia. The work of Hurst, Curschmann, Weinberg, and others would indicate that the achylia represents a primary constitutional familial deficiency. Naegeli has pointed out that homolysis is not always necessary and looks on a primary bone-marrow deficiency as the important conception. The laboratory evidence bears out the view expressed in your paper of 1913."

**Personal communication.

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The nervous picture in pernicious anemia is ill defined, protean, variable and progressive. Subjective sensory disturbances are usually the earliest manifestations. Beware of paresthesias, and numbness in the fingers and toes in elderly people; they may precede by months the more obvious changes. Even though the blood picture is wanting, yet the presence of such a cardinal symptom as the loss of deep sensation (loss of vibration sense, of sense of posture and inability to appreciate passive movements of fingers and toes) which is absent in only a small minority of the cases is presumptive evidence that we are dealing with this intractable malady. Touch, temperature and pain are usually normal in the early stages, not being involved until late in the course of the disease or possibly not at all. (Cadwalader?)³ It may masquerade as a multiple peripheral neuritis. Recently I observed a case where a hysterectomy had been performed in the vain hope of curing a progressively increasing weakness and a marked sensory disturbance of two years standing. The nervous syndrome is entirely dependent upon the extent the central nervous system is involved. Taylor* states "that the cord changes are much more frequently associated than we have been accustomed to assume and this would be shown were we more skillful in our blood examinations and more accurate in our histological studies." Some time ago, I read a paper before this Association on the "Subacute Combined Degeneration of the Spinal Cord," showing that similar cord changes may occur independently of pernicious anemia due to infections and a great variety of causes. Hunter describes a case of sub-acute combined degeneration of the cord with patches of croupous enteritis in the jejunum. Some 80.6 per cent of patients suffering from this disease, according to Woltman,⁴ develop nervous tissue change. Degenerative changes, once having occurred, never recede, even though there be a remission and the blood picture shows little or no abnormality; a subsequent fatal attack is only a matter of time. Courtney⁵ repeatedly calls attention to the marked dissociation between the blood state and the cord lesions. He has observed the lesions go steadily on in spite of marked improvement on the part of the blood. Sensory disturbances, both subjective and objective, may occur in an apparently normal cord. (Hamilton and Nixon.)⁶ Homer wrote twenty-four

*Personal communication.

books about the wanderings of Ulysses. As a college student I wished his labors had been less prolific. I do not wish to imitate him. I shall not, therefore, discuss the etiological, clinical or pathological phases of this disease. That would be Homeresque. The literature of this subject is most voluminous and is at the command of all. My purpose is to call your attention to some recent work done on the blood serum of these patients, making possible a diagnosis long before obvious changes occur, which, if confirmed, must possess a great value, not only in the early diagnosis which at present baffles the most clever clinicians, but also in enabling us to differentiate between it and the secondary anemias. In this work which has so many of the characteristics of pioneering, a healthy skepticism must be observed. No one is more conscious than my associates and myself that this preliminary note dealing with the recent work on the blood serum as an aid in early diagnosis is far from satisfactory. It will require years where we have only had months to confirm or reject this contention. The unreliableness of our present methods of procedure and the great boon it would be to both patient and doctor has seemed to us sufficient justification for our present endeavor. While it may be an illusion of hope, yet it is far from being inconceivable that if detected in its incipency pernicious anemia might be arrested.

The original work done in this country by Putman, Dana, Wilson and others dealt with the fundamentals of its neuropathology. These have been verified and added to by subsequent workers. Recently, Dr. Hassin,⁷ Chicago, has done some very remarkable histological work on multiple sclerosis and has made most interesting comparisons between the lesions of this disease and those in the cord changes of pernicious anemia. In Bramwell's case the clinical symptoms were characteristically those of multiple sclerosis. Hassin's investigations lead him to believe that pathologically the changes in subacute combined degeneration and multiple sclerosis are the same; that it is almost impossible to distinguish between them. The degenerative change in subacute combined degeneration, according to him, is "more powerful, more striking than in multiple sclerosis"; while in the former the axones degenerate in systems, in the latter they go as single fibers. (Barker.)

Globus and Strauss⁸ regard the pathologic process as degenerative in character due to a toxin of

unknown origin. They also state that the histologic picture is in the main similar to that found by Hassin in multiple sclerosis for this purely degenerative condition.

Taylor states that subacute combined degeneration is never truly systemic; that it is always diffuse—outside the actual system tract. Clinically one cannot differentiate between the nervous syndrome of pernicious anemia and the cord degeneration arising from other causes; if under these conditions the blood serum enables us to do this, it will be a notable advance. To the general practitioner who sees these patients first, it will be a procedure of inestimable value. Hassin suggests that future studies of multiple sclerosis must be confined to the biological, pathological and serological investigations of the spinal fluid. Because of the pathological similarities in these two diseases, a like method of research in the latter disease is worthy of consideration.

Since the degenerative process occurs in the medullary portions of the brain with about the same frequency that it does in the spinal cord,⁹ mental abnormalities are common. In 650 necropsies on the insane in Michigan, Barrett found pernicious anemia present in 2.3 per cent. Cabot in 647 cases noted the incidence of mental symptoms in 15 per cent and Weisenberg states that they are present in 40 per cent of the patients (Woltman). Eighteen years ago, Langdon pointed out that the mental symptoms like those of the cord may precede the anemia. These manifestations he designated as "pre-pernicious anemia." I have seen an apparently secondary anemia overshadowed by a recurrent melancholia, only to reveal its true nature after a tonsillectomy. There is no distinctive psychosis in pernicious anemia. The mental symptoms are indicative of a "toxic-organic" process affecting the central nervous system. If the cerebral cells lack oxygen, as may occur in severe cases of pernicious anemia, permanent mental¹⁰ changes are observed. Darden and Hall¹¹ think that the mental disturbances directly dependent on pernicious anemia should be classed as exhaustive or toxic psychoses. Where manic-depressive insanity and dementia precox states occur, the anemia simply acts as an exciting cause in a predisposed individual.

Constantly has the physician striven to increase his knowledge of the human body. For almost two and one-half centuries has he used the microscope to reveal its minute structure. For a century has he

employed the stethoscope to aid the ear in recognizing the sound of a disturbed mechanism. Indeed, the value of the clinical thermometer was not appreciated until the middle of the nineteenth century. The body, fundamentally, is a chemical machine. The laboratory has opened up new vistas and marvelously increased our knowledge of disease. It was the laboratory that gave us our first clear conception of trench nephritis—perhaps the greatest cause of loss of man-power during the great war—and it is through the laboratory that this study of the blood serum opens up a fascinating field of research, with an opportunity of rendering effective service to a class of long-suffering patients, with a possibility of this investigation being a milestone on the path of progress in biochemical research which ultimately will lead to a revelation of the cause of this intractable malady.

"In full fair tide let information flow—

That evil is half cured whose cause we know."

About 1920, Brockbank¹² first noticed that the color of the plasma or serum of pernicious anemia differed from that seen in the plasma or serum of normal blood or of any other anemia. Since making the observation he says, "I have used it regularly in the diagnosis of pernicious anemia and found it a most useful and reliable, if not a pathognomonic test of this anemia." The serum, according to this observer, is always a definite yellow color, varying in tint from that of a cowslip to the buttercup yellow of Canada balsam, whilst the serum of all other anemias is much paler and resembles straw-colored water." He states that from the observation of a score or more of cases of pernicious anemia, and twice the number of other anemias, a diagnosis of pernicious anemia from other forms of anemia can be made. The outstanding fact is that the serum of severe secondary anemia is a pale straw-color, not yellow. He also says that "there is no question of any pink color in the deeper colored yellow serum—nothing whatever to suggest the presence of any trace of hemoglobin or hemolysis nor is it of a bile pigment tint." The occurrence of hemolysis must be carefully guarded against. This can be avoided by "drawing 0.5 c.c. of sterile five per cent sodium citrate solution through the sterilized needle into the sterilized syringe and withdrawing the piston to its full extent, thus rinsing the barrel of the syringe with the citrate solution, which is then expelled from the syringe."

Panton, in his "Clinical Pathology" states that "the bile color of some serums is more closely simulated by the greenish yellow pigment present in the serum of nearly all cases of pernicious anemia." Stengel,¹³ in a discussion of secondary hypoplastic anemia refers to the yellowish color of the blood plasma in pernicious anemia, stating that the above types present many findings of pernicious anemia, except that the blood plasma has not the definite yellow color. Brockbank thinks that the cause of this color of the serum is due to oxyhemoglobin. He demonstrated this by the examination of the serum with a pocket spectroscope which revealed two very distinct absorption bands in the position of those of oxyhemoglobin. There was a much less distinct narrow third band farther to the right in the green in some specimens. Later he checked up the pocket spectroscope with a laboratory instrument, with which the wave lengths of the definite absorption bands could be measured. In all the cases they were identical with the absorption bands of oxyhemoglobin. In normal blood serum the same absorption bands were present, though generally less distinct. No absorption bands were seen in any other form of anemia. The absorption bands were present in all specimens of pernicious anemia examined with the exception of the very pale ones. These bands are very distinct in the deeper colored serums. Continental workers have not confirmed the spectroscopic researches of Brockbank. Hematin has been observed as a pathological constituent in the serum of pernicious anemia and the yellow color has been explained by a small addition of the bilirubin to the oxyhemoglobin dissolved in the serum.

The Ariadne clue to the complete knowledge of this disease lies along the pathway of biochemistry. Much splendid work has been and still is being done along this hopeful line. Duke and Stofer¹⁴ give as a probable explanation for the apparently relatively good color of many patients with pernicious anemia, in spite of a low blood count, the fact that the capillary red blood counts on these patients were on an average 17.6 per cent higher than similar counts on venous bloods. At the same time, the capillaries contain also an increased number of macrocytes.

Gettler and Lindeman¹⁵ give the results of the chemical and physical analysis of the blood in 87 cases of pernicious anemia, showing such findings

as increase in non-protein nitrogen, urea and creatinin values as well as greatly increased uric acid and amino-acid content. Other interesting findings are high blood sugar, subnormal alkaline reserve, as well as low refraction and specific gravity. Similar studies, together with those of the functional capacity of the various organs, have been made by Kahn and Barsky.¹⁶ McMaster, Rous and Larimore¹⁷ have shown that the marked siderosis of the liver parenchyma that occurs during pernicious

anemia is caused by an injurious agent derived from the gastro-intestinal tract. Recent studies by Gibson and Howard¹⁸ show low blood and plasma cholesterol figures as well as low urea, and moderate ammonia nitrogen and high uric acid figures. A study of severe cases of secondary anemias by Mark¹⁹ shows the similarity of the blood picture between many cases of secondary anemia and those of pernicious anemia, and the importance of developing more pathognomonic signs; while the high color index is very suggestive, recent observations have convinced him that certain patients with that disease may at sometime in their course present a low color index. Wearn, Warren and Ames²⁰ find that red blood cells from donors in Group IV transfused into patients in Group II with pernicious anemia and

anemia secondary to nephritis remain in the circulation an average of 83 days. Ashby²¹ has shown that the life of the transfused corpuscle extends thirty days or more. Denny²² states that in ten cases of pernicious anemia the total blood volume was reduced in all but two cases, while the plasma remains normal. The examination of the duodenal contents for an increase in the urobilin and urobilinogen content in patients with pernicious anemia as emphasized by Schneider²³ and later by Giffin, Sanford and Szloppa,²⁴ is a valuable

procedure, but this test, unfortunately, is too complicated for the use of the average practitioner. It may be regarded as confirmatory evidence not in itself diagnostic. Increased metabolic readings in pernicious anemia, as observed by a number of men, while most interesting, are disappointing as regards differential diagnosis. Leschke and Neufeld²⁵ find no difference in the examination of washed red blood corpuscles in pernicious anemia, secondary anemia, polycythemia, hemolytic icterus

and in normal individuals. They also state that the brownish color of the blood in pernicious anemia is accordingly not referable to a degeneration of the hemoglobin, but is more probably due to the presence of waste products of the blood pigment like the dark yellow color of the serum. The responsible disintegration products of the blood pigment are methemoglobin, hematin and especially bilirubin. Dr. Bernheim* feels that the icterus index offers a very important differential point in patients with pernicious anemia, it being about 10 in the average case, whereas in secondary anemia it ranged between 2.3 and 3.9 in cases examined by her. DeWitt Stetten²⁶ cites several instances of pernicious anemia with an icterus index above normal.

While this research work is fascinatingly interesting

and possesses great potentialities and possibly the ultimate solution of this most perplexing problem, yet unfortunately it does not enable us to make a diagnosis. Happily, this is just what an observation of the blood serum does; it is a simple procedure at the command of every medical man; no annoying delay, no complicated laboratory technic. The simplicity of this method is so marked and its diagnostic importance so great, that the astounding fact is that its real significance was not recognized long ago.

*Personal communication.

Early Diagnosis of Pernicious Anemia from Blood Serum.



The following twenty cases are excellent illustrations of the anemias, the first ten being primary, the remainder secondary. Of the former, the picture was definite and the diagnosis not to be questioned.

CASE I. J. D. Age 37 years. Past history negative. Present illness has extended over the last two years. Patient says that the first thing he noticed was shortness of breath on running up stairs. This has gradually become worse, so that now when he walks up stairs he gets extremely short of breath. If it is a long flight he must stop and rest, not from weakness but from lack of air. For the last three months patient has noticed that his strength has been getting less and that he has not been able to do his work as usual. Finally, he had to give up his position a few days ago because of his weakness. He would be extremely tired at night. On any extra exertion, for the last six months, patient has noticed that his heart would beat very fast and that he would have a dull aching precordial pain. This would last only about ten or fifteen minutes after he started to rest. Of late he has noticed that on even slight exertion this pain would develop. For the last year he has noticed numbness in legs and hands. This is worse in feet but also spreads up the legs; days that he does not have any feeling in the feet. For the last four or five weeks he has had diarrhea; having four or five watery stools at night. Was in hospital one year ago for the same trouble. After leaving the hospital he felt fine for four or five months, until about September; since then his symptoms have been getting progressively more marked. Physical examination: Marked pallor of skin and mucous membranes. Tonsils, atrophic, chronic, infected. Spleen, not palpable. Positive findings. neurological: Right knee jerk, —2 on 1, 2, 3, 4 basis; left knee jerk, —4 on 1, 2, 3, 4 basis. Achilles, right —4; left —4. Sensation, —2 —3 to pain, lower extremities on 1, 2, 3, 4 basis; —1 —2 to touch, lower extremities on 1, 2, 3, 4 basis. Vibration —4 lower extremities. Laboratory: urine negative; stools negative. Absence of free HCl in gastric contents. Blood count: Hemoglobin, 40%; r. b. c., 1,490,000; leucocytes, 4,000; differential, 100; polymorphonuclear, 56%; lymphocytes, 43%; eosinophile, 1%; poikilocytosis marked; anisocytosis marked; polychromatophilia marked; basophilic stippling marked; red cells have anemia centers. Nucleated reds present in large numbers. Diagnosis: Pernicious anemia.

CASE II. Mrs. J. D. Age 58 years. Influenza, 1918. Patient has been delicate for past eight or ten years. Under weight; has been pale as long as she can remember. Apparently not more marked recently. Moderate weakness. No history of sore tongue; no paresthesias; no numbness until one month ago, since when slight numbness of lower legs. Several attacks of upper right abdominal pain past year. Last attack one month ago and associated with vomiting. Physical examination: Marked pallor of skin and mucous membranes; malnutrition; spleen not palpable; tenderness right upper quadrant. Neurological, negative. Laboratory findings: Urine, negative; x-ray gallbladder shows distended gallbladder with two gallstones. Blood examination: Hemoglobin, 33%; erythrocytes, 1,740,000; leucocytes, 4,600; differential, 100; polymorphonuclear, 44;

lymphocytes, 42; large mononuclear, 10; transitional, 2; eosinophile, 2; poikilocytosis, xx; anisocytosis, x. Diagnosis: 1. Pernicious anemia; 2. Cholecystitis with cholelithiasis.

CASE III. Mr. G. A. Age, 43 years. History: Present complaint, weakness and pallor. Past history negative as to illnesses or operations. Patient states that his health was very good up to about two years ago, at which time he developed a severe cold, following which he had frequent colds in his chest with indefinite body pains in his neck and arms. His present illness started about one year ago, beginning with a numbness of the legs which has been constantly present and gradually growing worse. During this time the patient has been getting weaker. About three months ago he noticed that his skin was becoming yellow. He has been taking iron ampoules and regulating his own diet but has noticed no improvement in his condition. Appetite has been good; no nausea or vomiting, no colic, bowels and stools have been normal. Cardio-respiratory: edema, palpitation and dyspnea one plus. Patient states that swelling of the feet and legs has been quite marked and that he has had to buy larger trousers and shoes because of it. Patient uses tea, coffee, tobacco and snuff. No history of sore tongue. Best weight, 170; present weight, 162. Physical examination: Tonsils buried and chronically diseased. Septum deflected moderately to the right. Teeth show alveolar abscesses. Skin shows a marked pallor of the lemon yellow type and the mucous membranes are pale. Anus shows external hemorrhoids with fissure. Poor co-operation on sensory examination (probably negative). Joint lower extremities apparently —2 —3. Vibration —3 —4. Patient's mental condition questionable. At times he seems to be somewhat irrational and at all times is uncooperative. Laboratory findings: urine, negative; blood, 6-19-23, hemoglobin, 34%; r. b. c. 1,250,000; w. b. c. 6,000; color index, 1.3, few nucleated reds, marked anisocytosis, moderate achromia, marked poikilocytosis, polychromatophilia and stippling. Diagnosis: Pernicious anemia, infected tonsils, alveolar abscess, external hemorrhoids with fissure.

CASE IV. Patient, Mr. L. W. Age 62. Present complaint is marked weakness, duration past six months. Past history is negative for illnesses and operations. For the past four years the patient has had spells of weakness followed by periods of comparative good health. Last fall, during one of the weak spells, the patient vomited and once during the winter he vomited blood. Patient states that his hands and feet have felt numb, that they feel raw now and that his legs are very weak. The patient also complains of a pain over the gallbladder region, which has been present for the last three or four years. States that the onset of the whole trouble started with a severe cold. Appetite poor with occasional nausea and vomiting. No colic, bowels constipated with stools hard. No edema, moderate palpitation and dyspnea. No history of sore tongue. Physical: Nose shows very poor drainage with a deflected septum which practically blocks the right side. Teeth, caries and pyorrhea. Tongue shows marginal smoothness. Skin sallow with a lemon yellow tint. Mucous membranes poor color. Complete neurological not done because of patient's weakened condition. Joint sense of extremities, —2 —3; vibration sense, —3. Laboratory findings: x-ray of stomach and heart, negative;

urine, negative; gastric analysis shows a fair digestion, mucus three plus, very slight residue, no free HCl, combined HCl 8, total acidity 8, no lactic acid, no occult blood; blood Wassermann, negative; 6-6-23, hemoglobin, 56 per cent, r. b. c. 2,200,000, marked anisocytosis, slight achromia, a few shadow forms, no nucleated reds, moderate poikilocytosis, urea 22 mg., sugar, .125 mg.; 6-13-23, hemoglobin 66 per cent, red blood cells 1,800,000; 6-25-23, hemoglobin 45 per cent, r. b. c. 1,700,000. Diagnosis: Pernicious anemia; focal infection nose and teeth.

CASE V. H. M. Age 62 years; occupation, bookkeeper. Family history, negative. Past history, hay fever every year. About March, 1921, patient noticed numbness and tingling of hands. This gradually spread to the distal third of the forearms. Patient says it felt as if he had sand between his fingers. Nine months later numbness began in the lower abdomen and then spread to both lower extremities. For the past year he has had sharp shooting pains which start in toes and fingers. These pains are severe and last about fifteen minutes. Patient has lost about thirty pounds in past six months and feels very weak. About one year ago he had a very sore tongue which persisted for three months. Has had occasional vomiting spells and appetite is poor. Does not complain of abdominal pain. Physical examination: Marked pallor of skin and mucous membranes. Tongue moderately smooth and slightly atrophic; heart, slightly enlarged to left; spleen, not palpable; liver, palpable about 3 cms. below costal margin. Neurological: positive findings; joint sense extremities —3 —4; vibration sense extremities —3 —4. Laboratory: Hemoglobin, 20 per cent; erythrocytes, 1,030,000; leucocytes, 5,600; differential, 100; polymorphonuclear, 36; lymphocytes, 44; large mononuclears, 8; transitional, 10; eosinophile, 2; poikilocytosis, double plus; anisocytosis, double plus; nucleated r. b. c. few. Wassermann, negative. Urine, negative. Diagnosis: Pernicious anemia.

CASE VI. Patient, Dr. F. S. Age 60. History: Present complaint, weakness and pallor. Past history essentially negative. Patient operated March 4, 1919, for acute intestinal obstruction. Onset of present illness two years ago, at which time the patient became tired and weak and drowsy. This feeling of weakness has been gradually increasing up to the present time. During the past month he has noticed a change of color of the skin, an increasing yellowness. He has lost five pounds in weight the past month; headache for the past month. Eyes, ears, nose and throat negative. One year ago the patient had soreness of the mouth lasting about two weeks but there is no history of soreness of the tongue. Gastro-intestinal: Appetite has been poor; nausea but no vomiting. No jaundice; no colic; bowels have been rather constipated. Sweet things make the patient sick. Cardio-respiratory: No dyspnea; feet have been swollen past ten days. Lungs, negative. Extremities: numbness of legs past two weeks. Physical: Marked pallor of mucous membranes and lemon-yellow color of skin; heart slightly enlarged to left; edema; extremities —2 on 1, 2, 3 basis. Spleen not palpable. Neurological: knee jerks, right and left —3 —4 on 1, 2, 3, 4 basis. Achilles, —4 right and left; joint —2 —3 extremities. Vibration, —3 extremities. Laboratory findings; urine showed a slight trace of albumin; otherwise negative; blood, 6-9-23,

hemoglobin, 35 per cent; r. b. c., 1,100,000; w. b. c., 6,600; marked poikilocytosis and achromia. Moderate shadow forms; anisocytosis and polychromatophilia. Blood pressure, 90/60. Diagnosis: Pernicious anemia.

CASE VII. A. D. Age 56 years. Occupation, painter. Family history: mother died of cancer of stomach. Otherwise negative. Past history: Erysipelas two years ago; hemorrhoids past ten years. No bleeding. Present history: Past eight months numbness and weakness of legs; also developed coldness which extends up to his hips. For past month these symptoms have been much worse. No soreness of tongue. Marked general weakness. Examination: marked pyorrhea; slight pallor of skin and mucous membranes. Definite baldness; slight atrophy of tongue. External and internal hemorrhoids. Neurological: Joint extremities, —3; vibration extremities, —3. Knee jerks, right, plus 1 on 1, 2, 3, 4 basis; left, plus 2 on 1, 2, 3, 4 basis. Tactile sensation, —1 to hips. Pain, —1 —2 to hips. Temperature, —1 —2 to hips. Blood: hemoglobin, 75 per cent; red blood cells, 2,370,000; color index, 1.6; leucocytes, 4,600; P. M. N.'s, 62; lymphocytes, 32; large mononuclears, 4; eosinophiles, 2; poikilocytosis, plus; anisocytosis, plus; polychromatophilia, plus. Urine, negative. Gastric analysis: total acidity, 12; free HCl, none; lactic acid, plus; occult blood, plus. Diagnosis: Pernicious anemia; subacute combined sclerosis.

CASE VIII. W. M. Age 57, laborer. Family history: Mother died of tuberculous enteritis at 28. Past history: la grippe 3 years ago; gonorrhea several times; syphilis at 17 with treatment for two months; none since. Present complaint: past ten months patient has complained of tingling in hands and legs with numbness; also progressively increasing weakness. History of sore tongue off and on. Examination: quite marked pallor of skin and mucous membranes. Definite baldness and moderate atrophy of tongue. Pupils, right —2 to light; left, —2 —3 to light on 1, 2, 3, 4 basis; liver edge 3 centimeters below right costal margin. Neurological examination: positive findings: right knee jerk, plus 2; left knee jerk, plus 2; Achilles, right, plus 2; left, plus 2; increased spasticity both legs, plus 2; both sides show Babinski, Oppenheim, Chaddock, Gordon, Mendel, Bechterew and Rossilimo; joint sense right foot, —3; left foot, —2 —3; vibration sense, right foot, —3 —4; left foot, —3 —4; moderate impairment of pain, temperature, tactile sensation both lower extremities. Laboratory examinations: urine negative except slight trace of albumin. Stool negative. Test meal total acidity 8; no free hydrochloric acid. Blood examination: hemoglobin, 24 per cent; red blood count, 1,770,000; leucocytes, 6,750; polymorphonuclear leucocytes, 78; lymphocytes, 19; large mononuclears, 2; transitionals, 1; poikilocytosis, double plus; anisocytosis, double plus. X-ray of stomach and colon negative. Blood Wassermann and spinal fluid negative. Diagnosis: Pernicious anemia. Subacute combined sclerosis.

CASE IX. Mrs. A. W. Age 74, widow. Past history: Negative except father and three sisters had migraine. Past diseases: typhoid at age 15; diphtheria at age 14; migraine attacks up to age 41. Present complaint: patient developed pallor eighteen months ago which has persisted. Tendency to slight sore tongue off and on during this time but lasting only a few days at a time. Has had slight creeping

sensation in hands but no definite numbness since onset of trouble. Has also had an indefinite pulling sensation of the soles of the feet but no numbness. Examination: 1. Lemon yellow tinge to skin with fairly marked pallor of mucous membranes. 2. Tongue shows areas of partial baldness. No definite atrophy. 3. Diffuse slightly elevated areas of brownish color over chest and upper abdomen and arms (*Tinea versicolor*). 4. Blowing systolic murmur over precordium transmitted to axilla. Heart normal in size. Neurological examination negative. Laboratory findings: Urine negative except slight trace of albumin. Blood: hemoglobin, 45 per cent; red blood count, 1,500,000; leucocytes, 3,600; polymorphonuclear leucocytes, 84; lymphocytes, 16; achromia, moderate; marked anisocytosis; marked poikilocytosis. Gastric analysis: total acidity, 6; free HCl, none. Diagnosis: 1. Pernicious anemia; 2. Mitral insufficiency; 3. *Tinea versicolor*.

CASE X. Mr. W. S. Age 34; single; occupation, clerk. Family history: negative. Past history: typhoid at 12; tonsillitis two years ago. Present complaint: patient has developed progressively increasing pallor and weakness past four months. No history of bleeding. Has also been troubled with sore tongue much of this time. Only slight loss of weight. No gastric disturbances. Examination: Lemon yellow tinge to skin with pallor of mucous membranes; diseased tonsils; marked baldness of tongue with slight atrophy; palpable spleen; right inguinal hernia. Neurological, negative. Laboratory findings: urine negative. Blood: hemoglobin, 52 per cent; red blood count, 2,300,000; leucocytes, 4,800; differential, negative; moderate anisocytosis; moderate poikilocytosis; occasional nucleated red. Blood Wassermann, negative. Gastric analysis: total acidity, 10; free HCl, none. Diagnosis: 1. Pernicious anemia; 2. Right inguinal hernia.

Of the secondary anemias, we have unfortunately not run across one with an exceedingly low hemoglobin.

CASE I. R. S. Age 33; single; occupation, laborer. Family history: negative. Past history: negative. Present complaint: past year the patient has had a persistent, indefinite dull pain slightly to the right of the navel. No radiation of pain. This pain has not been influenced by food but is somewhat worse when constipated and after exercise. No urinary symptoms. On two occasions, three months ago and two weeks ago, patient developed profuse bloody stools, bright red in color, and extending over several days. No definite abdominal pain with these spells. Following this a fairly marked pallor developed which has persisted. Examination: Marked pallor of skin and mucous membranes. Moderate tenderness over McBurney's. Urine, negative. Stools (3) negative for occult blood; x-ray of stomach and colon negative; proctoscopic negative. Blood hemoglobin, 40 per cent; r. b. c., 3,504,000; leucocytes, 5,700; differential, negative; moderate poikilocytosis and anisocytosis. Gastric analysis: negative in all respects. Free HCl, 22. Diagnosis: 1. Secondary anemia following hemorrhage from bowel of indeterminate origin; 2. Chronic appendicitis. At operation a chronically diseased appendix was removed. The bowel did not show any other pathology. The gallbladder was negative. The stomach showed a small duodenal ulcer.

CASE II. Mrs. J. S. Age 21. Family history: Mother has migraine; one sister has always looked pale (never had blood tested, however). Past history: Appendectomy two years ago; chorea when nine years of age. Present complaint: Since three years of age patient has been subject to attacks of abdominal cramps in lower middle abdomen, coming at times as often as several times a year and again not for few years. These spells last about six hours and are associated with diarrhea, there being eight to twelve movements during each attack. No pus or blood has been observed in the stools. Was operated on two years ago, elsewhere, following a spell and the appendix was removed. No spells past six months. The patient has always been somewhat pale but especially since birth of last child. Past week patient has had twitchings of right arms and right leg and has been depressed, restless and has given expression to suicidal impulses. Also moderate weakness. No history of numbness, no paresthesias, no definite history of sore tongue. Examination: fairly marked pallor of skin and mucous membranes. Several abscessed teeth; diseased tonsils; palpable spleen; three examinations for blood and parasites were negative; x rays of colon and sinuses were negative. Spinal fluid and blood Wassermann were negative. Gastric analysis was negative throughout. Hemoglobin, 57 per cent; r. b. c., 3,700,000; white blood cells, 7,400; lymphocytes, 16; transitional, 2; p. m. n., 77; polymorphonuclear eosinophiles, 1; basophiles, 1; moderate anisocytosis; marked achromophilia. The patient was on forced nourishment, tonics, and a tonsillectomy and extraction of several teeth were done. Marked improvement followed the latter two procedures, the hemoglobin being 75 per cent on discharge. Diagnosis: 1. Chorea (Sydenham's); 2. Secondary anemia (infectious in origin); 3. Diseased tonsils; 4. Abscessed teeth; 5. Acute recurring enteritis (probably infectious in origin).

CASE III. C. F. S. Age 66 years. Family history: one brother died of diabetes at 70. Previous diseases: rheumatic fever fifteen years ago; several attacks. Influenza twenty-five years ago; four attacks. Present illness: Patient has always been obstinately constipated. He has also experienced a moderate degree of dyspnea for years, as well as a tendency to weakness. His health has been good otherwise up to one year ago, since when all the symptoms have been more marked. The weakness especially has been getting more progressively marked this last year, together with an increasing pallor. With the spells of constipation there is a tendency for the patient to develop vague chest pains as well as pains in the muscles of the hack and a feeling of oppression over the heart. There has also been a tendency to feel depressed. There has been no history of sore tongue nor diarrhea. No numbness or paresthesias; and also no history of bleeding. For the last two years there has been a steadily increasing difficulty in walking; a block greatly exhausts him; after slight exertion feels as if the limbs would not support the body. Physical examination: the color is of a muddy pallor. No definite lemon-yellow tinge. Slight cyanosis of the lips, mucous membranes pale. Radial vessels moderately hardened but no definite calcareous deposits. Heart measure, right, 2.5 cm., left, 11.5 cm. There is a blowing systolic murmur at the apex transmitted to the axilla. There is also a soft blowing systolic

murmur at the aortic area; the aortic second sound is slightly accentuated. Spleen not palpable. Rectal examination showed moderate external and internal hemorrhoids. Blood pressure, 167-78. Laboratory: Hemoglobin, 54 per cent; r. b. c., 3,600,000; w. b. c., 6,400; moderate achromia. Marked anisocytosis; moderate poikilocytosis; moderate polychromatophilia; blood urea showed 22 mg. per 100 c.c. Blood sugar, .169 per cent. Metabolism, —5. Deep and superficial reflexes normal aside from a questionable Babinski in left foot. Vibratory sense diminished in both lower extremities, more marked in left than right. Tactile sense diminished in both feet to the ankle. Diagnosis: 1, Secondary anemia; 2, Moderate arteriosclerosis; 3, Hypertension; 4, Mitral insufficiency with slight cardiac enlargement to the left; 5, External and internal hemorrhoids.

CASE IV. Miss A. B. Age 48. History of flowing off and on for last six weeks between periods. Latter have been profuse past year. Progressively increasing weakness. Examination: Fairly marked pallor of skin and mucous membranes. Uterus enlarged to size of three months' pregnancy. Hemoglobin, 37 per cent; r. b. c., 2,900,000; marked anisocytosis and poikilocytosis and moderate polychromatophilia. Diagnosis: 1, Fibroid uterus; 2, Secondary anemia.

CASE V. Mr. E. E. Married. Age 55. Patient gives a history of tarry stools occurring over a period of several days in March, 1923. This recurred three weeks ago. Patient has had an indefinite distress in epigastric region for the past month not amounting to actual pain. Slight amount of gas; no vomiting. Progressively increasing weakness past month and loss of about eight to ten pounds. Examination: Pallor of skin and mucous membranes; fairly marked. Heart slightly enlarged to left; moderate external and internal hemorrhoids (no bleeding); deformity of duodenal bulb; no retention in stomach. Hemoglobin, 46 per cent; r. b. c., 3,000,000; w. b. c., 7,800; marked anisocytosis and poikilocytosis. Free HCl 3. Gastric analysis otherwise negative. A diagnosis of probable duodenal ulcer and secondary anemia was made and the patient explored. At operation the pancreas was found to be about three times its natural size, fairly hard and impinging on the duodenum, causing the above deformity. The gallbladder, which was thick-walled and bound down by adhesions, as well as a moderately diseased appendix, was removed. It was the opinion of the surgeon that the pancreatic condition was that of a chronic pancreatitis. Subsequent examination—about two months later—showed the patient much improved with a hemoglobin of 75 per cent and red blood count of 4,400,000.

CASE VI. Mr. J. S. Age 54. Occupation, miner. Married. Family history: Mother died at 55, heart disease. Past history: pneumonia. Present history: past eight months epigastric distress daily, coming on right after eating. Previous to this had had epigastric distress off and on one to two hours after meals with food relief. With distress now has gas and bloating. No vomiting. Loss of fifteen pounds in weight with increasing weakness and pallor. Examination: Moderate pallor of skin and mucous membranes. Mass in epigastric region; diseased tonsils; one abscessed tooth. Laboratory findings: urine negative. Gastric analysis: total acidity, 67; free HCl, none. Wassermann, negative. Blood: hemoglobin, 56 per cent;

r. b. c., 2,400,000; leucocytes, 5,600; differential, negative. X-ray of stomach showed marked filling defect of pyloric end of stomach. Diagnosis: 1, Cancer of stomach (inoperable); 2, Secondary anemia.

CASE VII. W. P. Age 65 years. Family history, negative. Past history: Rheumatic fever every year past four years. Present complaint: past three weeks patient has had generalized swelling of joints. Practically all large joints moderately swollen, with stiffness, slight redness and considerable pain. Temperature up to 102. No sore throat. Patient has been rather pale the past year. No history of bleeding. Examination: Moderate swelling of right knee and left wrist with limitation of movement and slight redness. Moderate pallor of skin and mucous membranes. Laboratory findings: Urine negative. Blood: hemoglobin, 55 per cent; r. b. c., 3,050,000; w. b. c., 13,000; p. m. n., 49 per cent; lymphocytes, 48 per cent; eosinophiles, 1; slight poikilocytosis and anisocytosis; basophiles, 2. Diagnosis: 1, Acute polyarthritis; 2, Secondary anemia.

CASE VIII. Mrs. G. L. Age 34. Married. This patient gives a history of impaired health the past two years, manifesting itself chiefly as weakness and anorexia. During this time she has had spells of indefinite fever, the temperature going up to 103 towards the end of the day for a period of several weeks. At these times the weakness is much more pronounced and she is confined to bed. With one of these spells there was an associated attack of abdominal pain and her appendix was removed elsewhere. There is no history of diarrhea; no cough, etc. On examination the following findings were found: marked pallor of skin and mucous membranes. Nine abscessed teeth. Diseased tonsils; moderate abdominal distension and generalized tenderness. Blood count: Hemoglobin, 58 per cent; r. b. c., 3,460,000; w. b. c., 4,400; lymphocytes, 38 per cent; large mononuclears, 3 per cent; p. m. n., 59 per cent. Moderate anisocytosis and poikilocytosis. Examinations such as blood Wassermann, x-ray of chest, investigation for plasmodia, daily four-hour temperature and pulse rate over a week, etc., were negative. Diagnosis: 1, Secondary anemia of septic origin; 2, Alveolar abscesses; 3, Diseased tonsils. The patient was put to bed; extraction of teeth and tonsillectomy were done. She gradually improved on tonics and forced nourishment and when discharged the hemoglobin was 76 per cent.

CASE IX. Mrs. J. S. Age 34; married. Occupation, housewife. Family history, negative. Past history: pneumonia four years ago; influenza two years ago. Present complaint: bloody stools off and on past few years. Up to four months ago, only occasional spells when bright red blood in stools. Past four months small amount of blood in stools practically daily. General health fairly good except somewhat weak. Examination: Moderate pallor of skin and mucous membranes. External and internal hemorrhoids. Laboratory findings: Blood: Hemoglobin, 46 per cent; r. b. c., 3,200,000; differential count negative; slight anisocytosis and poikilocytosis. Urine, negative. Diagnosis: 1, Internal and external hemorrhoids, bleeding type; 2, Secondary anemia due to bleeding hemorrhoids.

CASE X. Mr. J. C. Age 64; married. Occupation, laborer. Family history: Mother died at 50 of heart trouble; father died at 60 of nephritis. Past illnesses:

none. Present complaint: Past nine months patient has been getting progressively weaker and losing weight—loss of 50 lbs. Developed jaundice at onset of trouble, which has become gradually more marked. Noticed a mass in upper right abdomen which has increased in size. Has had progressively increasing gastric distress as dull pain in epigastric region immediately after eating, with occasional eructations of food. Examination: Marked generalized jaundice; marked pyrrhea; emaciation; pallor of mucous membranes; liver extending 8 cm. below right costal margin, hard and irregular. Laboratory findings: Gastric x-ray shows filling defect at pyloric end of stomach. Blood Wassermann, negative. Urine negative except for trace of albumin. Blood: Hemoglobin, 50 per cent; r. b. c., 4,120,000; leucocytes, 9,400; differential, negative; slight anisocytosis and poikilocytosis. Gastric analysis: total acidity, 8; free HCl, none; blood, positive; Boas-Oppler bacilli present. Diagnosis: Cancer of stomach with metastasis of liver; obstructive jaundice; secondary anemia.

The above cases are sufficiently basic and are certainly representative of the anemias, while at the same time they happily exemplify the specific conditions as to the color of the blood serum and its differential significance. The contrast in color is so marked that one cannot mistake it. The yellow color of the blood serum in pernicious anemia may even show a slight greenish tinge with the yellow. Brockbank states there has been no greenish tint in any of his cases. The straw color of secondary anemia varies from a pale straw to a deep straw, depending upon the degree of anemia present; the color of the serum of normal blood is a pale yellow of deeper tinge than that of secondary anemia but not as deep a yellow as that of pernicious. Occasionally a normal serum may approach the color of pernicious anemia, but after having observed several specimens of the latter, the differentiation is not difficult. Spectroscopically, the serum of primary anemia absorbs almost completely the violet end of the spectrum but Dr. Kvitrud has not been able to demonstrate distinct bands of oxyhemoglobin between the D and E lines of the spectrum, and Prof. Joseph Valasek of the Department of Physics, University of Minnesota, has confirmed his findings. Normal serum absorbs a little of the violet at the extreme end but never as much as pernicious anemia. If the serum of the latter is kept in a sealed tube in a few days it begins to lose its color. Unsealed, change is apparent in 24 hours.

Ten years ago I emphasized the importance of the recognition of the nervous syndrome in pernicious anemia, as an aid in diagnosis. Today I am calling attention to a study of the blood serum in this disease as a positive and more reliable aid in

diagnosis even before recognizable changes become apparent. It also enables one to differentiate the nervous disturbances of primary anemia from those due to other toxic influences. There is a feeling that an intractable disease of this character is hopeless, that palliative measures only are indicated, that a possibility of a discovery of its cause and using appropriate therapy is merely a pious hope—the dream of a visionary. It is well to recall what Sir Francis Bacon says regarding supposedly incurable disease—"A work therefore is wanting upon the cures of reported incurable disease that physicians of eminence and resolution may be encouraged and excited to pursue this matter, as far as the nature of things will permit, since to pronounce incurable is to establish negligence and carelessness, as it were, by law and screen ignorance from reproach."

Biochemistry* has greatly enriched our knowledge of this disease; it has not, however, measurably increased our diagnostic acumen. Humiliating though it be, yet we do not know any more about the etiology and cure of this disease than we did one hundred and one years ago when Combe reported the first case. Those were immortal words with which John Hunter addressed Jenner when he was thinking of investigating vaccination—"Do not think, but try; be patient, be accurate."

To the laboratory, nevertheless, we are to look for the ultimate revelation of the pathogenic factor and a subsequent rational therapy. We must not forget, however, that attractive theories too frequently are like glow-worms; they seem brighter from afar. We should never lose sight of the fact "that the history of progress is the attainment of the supposedly impossible." "Before a discovery can be made," says DaCosta,²⁷ "the scientific imagination of some one must flash into Auroral hues."

CONCLUSIONS

1. The nervous disturbances in pernicious anemia are characteristic and distinctive and are observed in over 80 per cent of the cases. Their presence should always suggest the probable occurrence of this disease.

2. The yellow or greenish yellow color of the blood serum in pernicious anemia is easily recog-

*The blood test of Dr. Shaw-MacKenzie, by means of which he has been able to differentiate cancer of internal organs from other non-cancerous conditions in the majority of cases and in obscure cases to exclude the presence of cancer, is believed to possess great diagnostic possibilities. In a total of 221 serums examined, the method has proved correct in 212 or 95.5 per cent. (Simpson.)

nized by the naked eye and is a positive—one might say with Brockbank—*almost a pathognomonic symptom* of this disease.

3. The blood serum of secondary anemia varies from a pale to a deep straw color and, when contrasted with that of the pernicious type, a failure to distinguish between them is not possible.

4. The color of normal blood serum is a pale yellow, has a deeper tinge than that of the secondary form and while it may occasionally resemble it yet after a little experience differentiation is simple.

5. The absorption bands of oxyhemoglobin, described by Brockbank, as explaining the yellow color of the serum in primary anemia, Dr. Kvitrud has been unable spectroscopically to demonstrate; his observations have been confirmed by Prof. Joseph Valasek, Department of Physics, University of Minnesota.

6. The buttercup yellow in the blood serum of primary anemia is readily seen by the unaided eye. With a little experience the practitioner can, by its observation, make a diagnosis of this disease before definite changes manifest themselves.

7. The blood serum in the border-line cases requires patient research. A later contribution may be expected.

NOTE: I am greatly indebted to Dr. Gilbert Kvitrud, Director of the Laboratory of Mounds Park Sanitarium, for painstaking research, and to Dr. Arthur E. Mark, for his aid in the collection of cases and review of the literature. Without their assistance this paper would not have been written. To Miss Hirsch of the Department of Anatomy, I am indebted for the drawings of the blood serum from the actual specimens, and to my friend, Dr. Frank E. Burch, for the excellent colored slides.

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DISCUSSION

DR. GILBERT KVITRUD, St. Paul: Dr. Brockbank says that he finds the absorption bands of oxyhemoglobin in the serums of most of his pernicious anemia patients. I have examined the serums of ten or more primary anemias and have as yet not been able to find distinct bands between

the D and E lines of the spectrum when using an absorption cell 1 cm. thick. The only absorption seen with the two prism indirect spectroscope is at the violet end of the spectrum, the violet being usually completely absorbed.

Drs. Riggs, Mark and myself have studied the serums from a number of pernicious and secondary anemia patients as to color and agree with Dr. Brockbank that these serums have a characteristic pigment. The color of a secondary anemia serum is pale straw, while that of primary anemia is deep yellow and at times a greenish yellow. We do not know what this pigment is or why it should appear in serums of pernicious anemia.

We will have something to say of the border line cases at a future date.

DR. CHARLES R. BALL, St. Paul: Mr. Chairman, Ladies and Gentlemen: I think we should be very grateful to Dr. Riggs for calling our attention to another diagnostic point in the early recognition of pernicious anemia. I confess that in most of the cases which come under my observation a diagnosis from the blood elements alone at the time I see them is very difficult. The blood picture may be suspicious but lacks very much of being pathognomonic.

For many years I have depended, in my recognition of this disease, more on the nervous symptoms than I have on the blood findings. In those cases which manifest nervous symptoms, these seem to be quite pathognomonic of this condition.

Chief among these symptoms is a numbness in the fingers, and on the soles of the feet; the patients complain very much of this numbness and in the use of their hands and fingers are very clumsy. In the female patients, they complain that they are unable longer to sew because they cannot hold a needle.

In the men, they say they are unable to button their clothes and if you ask them to attempt to do this, you see that they are fumbling constantly for the button and the button-holes. The sensation in their finger tips is not sufficient for them to recognize these distinctions.

Also, there is an exquisite sensitiveness, quite general all over the whole body but perhaps best exemplified in the calves of the legs. You can bring this out nicely by pinching the calves.

Then, there is quite a marked disturbance in balance.

In the connection in which these symptoms are found, it is not difficult to differentiate pernicious anemia findings from other disease. I cannot think of any condition which presents quite this syndrome in the background in which it occurs.

Then, the tongue has been quite an important factor in the aid to diagnosis. You all know the characteristic tongue so often seen in pernicious anemia, the rather small atrophic looking tongue which is red and perfectly clean and sometimes sore around the edges. This is a factor which should never be neglected in making a diagnosis.

I used to think that the nervous symptoms were due to the anemic condition in the blood. I have long ago given up this idea.

In my opinion, the nervous findings are due to the same toxic agent which causes the blood changes. Sometimes this toxic agent depresses the blood almost entirely and does very little damage to the nervous elements, while in other cases the situation is exactly reversed. The nervous

elements are the ones which seem to be affected the most and the blood changes are moderate or perhaps none which one is able to recognize.

Two years ago I had two very interesting cases occurring in a man and his wife. The man had a high grade of anemia and very few nervous symptoms. The wife had no blood changes whatever but marked nervous disturbances such as one would expect in a case presenting a combined sclerosis.

These two cases of pernicious anemia occurring in man and wife makes one wonder if there may not be some tendency of an infectious nature in this condition.

If this serum test, which Dr. Riggs has presented to us, proves to be reliable, it will make the early recognition of cases of pernicious anemia much easier than it is at present.

DR. HENRY WOLTMAN, Rochester: It is given to very few men to see their contributions withstand the weathering influences of 27 years. Dr. Riggs was the first in this country to report a case of pernicious anemia with microscopic examination of the central nervous system and we find that his observations stand today as they did then. Prophecy is a dangerous business for the prophet, but here, too, he has succeeded for his assertion that the examination of the nervous system would prove to be a valuable aid in the early diagnosis of pernicious anemia has been amply verified.

Recent evidence has been adduced by Martius, Weinberg, Hurst and others, that goes to show that the achlorhydria, the *sine qua non* of pernicious anemia, is not the result of an atrophy of the gastric mucous membrane, but represents a primary, constitutional, familial deficiency, present from infancy. It is only in these cases, supposedly, that pernicious anemia develops. Grawitz, furthermore, has demonstrated that hemolysis is often lacking, and regards a primary bone marrow deficiency as the important conception. This conception, too, is in line with the suggestion first made by Dr. Riggs, that individual predisposition probably determines which patients are going to develop degenerative changes in their nervous systems.

The clinical changes defied all explanation on the basis of known cord involvement alone, and it was not until Hamilton and Nixon demonstrated the frequency of multiple peripheral nerve degenerations that the problem reached solution. This fine piece of work, and Barrett's demonstration of Lichtheim foci in the brain, are the two outstanding contributions to our knowledge of the pathology of pernicious anemia since Lichtheim's original work.

I am not qualified to discuss the color reactions of the serum as described by Dr. Riggs, save to say that because of its simplicity it should prove to be of the greatest practical value to the general practitioner and hence of the greatest benefit to the patient.

Some years ago Blankenhorn called attention to the marked increase in bile pigments in the serum of pernicious anemia patients and stated that the intensity of the reaction ran parallel to the neurotoxicity exhibited by the case. I should like to ask Dr. Riggs whether the intensity of the color of the serum shows any parallelism to the neurotoxicity?

In 1904, Syllaba called attention to pre-pernicious anemia icterus. Is there any parallelism between the color of the serum and the intensity of the icterus?

There is always a tendency to attribute too much

specificity to a new test. Dr. Riggs warns against this, but may I ask whether this reaction has been observed in any other conditions, such as congenital hemolytic icterus? Possibly not enough cases have as yet been observed to answer this question.

Finally, may I ask about the color of the spinal fluid when this reaction is present?

DR. H. M. CONNER, Rochester: I also should like to ask Dr. Riggs if this color change is any different in pernicious anemia from that which occurs in any of the hemolytic anemias, such as, for instance, in hemolytic jaundice which Dr. Woltman has mentioned; also whether the color can be distinguished from that which occurs in any case of jaundice? Last spring it was my pleasure to talk with Dr. Bernheim, whom Dr. Riggs mentioned, regarding the color changes in the serum. At that time Dr. Bernheim was not able to distinguish between the color changes in jaundice and those occurring in hemolytic anemias. On the face of things, knowing that in the hemolytic anemias we have increased destruction of the red blood cells, it would appear that this color change is due either to the liberated hemoglobin or to the bile pigments formed from the excess hemoglobin. If this is true, one would not be able to make this test a diagnostic feature of pernicious anemia.

DR. C. EUGENE RIGGS (closing): When I was a boy in Sunday School I remember we had a lesson in which angels were spoken of. I asked the teacher, a very distinguished clergyman, if he knew what an angel looked like. He smiled and he said: "I don't, do you?" You understand this is a preliminary note, and these things that my good friend Woltman and the speaker following him emphasized, we have not had time to investigate. We have only had time to go into the simple facts that we have given to you today, and you will remember that I said that other communications might be expected.

I am sorry, but I will have to give you the same answer that the Sunday School teacher gave me, Dr. Woltman, with

reference to the questions you have asked. But we feel that if there is anything in this contention of Brockbank it is an especial boon to the general practitioner. It is something that as medical men we ought to investigate and consider with a critical judgment and reject if we find that our hopes have not been realized.

The last speaker asked with reference to the vibration test. That, of course, we very definitely find in primary anemia. I have forgotten the other question.

THE CHAIRMAN: Sense of posture.

DR. RIGGS: In this little abstract I gave you I could not make any reference to this because of lack of time. I might say that the loss of deep sensibility is the most important differential point from a nervous standpoint. Dr. Kvitrud will explain to you the preparation of this serum. If you get hemolysis it vitiates the diagnosis. I would like to say that these drawings which the doctor has are very much more satisfactory in every way than our slides and they were made by the artist at the University in the Department of Anatomy and taken from the actual laboratory specimens.

DR. GILBERT KVITRUD: Of course, this blood has to be obtained in such a way that there is no hemolysis and in order to do this we use a sterile syringe and rinse it out with a five per cent sterile sodium citrate solution. We obtain 5 c.c. of the blood and inject it into a test tube carefully so that there will be no mechanical hemolysis. Then put the tube in a slanting position so that the serum can separate out better than if the tube was upright. We usually leave it over night and then draw off the serum the next day and centrifuge it for quite a while with a high speed centrifuge. After that, it is ready for the examination by the spectroscope or grossly as to color.

It would be pretty hard to transport the blood. If you went some place to get it you would almost have to leave it there until the serum separated out, and then you could take the serum and centrifuge it when you get to your hospital or office.

SILICA IN TUBERCULOSIS

Compounds of silica have found a place during recent years among drugs of reputed value in the treatment of tuberculosis. In view of their extreme insolubility, one would scarcely expect them to exert any immediate pharmacodynamic effect. Nevertheless, there is evidence that silica finds its way into the tissues and organs and remains deposited, notably in connective tissues. This has given rise to the hypothesis that the element plays a part in determining the elasticity and tensile strength of fibrous tissues, although the smallness of the quantities of silica ordinarily found should make one extremely skeptical of the validity of any conclusion of this sort. Nevertheless, various silica-containing teas or drugs have been recommended in the hope that they would increase the amount or improve the quality of the connective tissue that forms the defense about tuberculous lesions. A study at the Sprague Institute in Chicago by Maver and Wells brought nothing but negative results through the administration of silica preparations to tuberculous animals.—*Jour. A. M. A., May 17, 1924, p. 1610.*

PROMONTA NOT ACCEPTED FOR N. N. R.

Promonta (manufactured by the Chemische Fabrik Promonta G.m.b.H., Hamburg, Germany, and distributed in the United States by the Acme Pharmaceutical Co., Chicago) is said to be "an organic preparation from nervous matter of the central nervous system combined with polyvalent vitamins, lime, iron, hemoglobin and soluble albuminoids." Promonta is reminiscent of the "Nerve, Brain and Skin foods," "nerve tonics," etc., which had their vogue in the United States before the passage of the Food and Drugs Act; like them, it is recommended for "neurasthenia," "all kinds of fatigue and exhaustion," "anemia," "bloodlessness," "impaired vitality," etc. The inclusion of "4 per cent" of "polyvalent vitamins" (source not stated) is a modern touch, as is also the reference to experiments on animals (with pictures) which had been made to grow more rapidly by the addition of "Promonta" to their usual diet. Promonta is an irrational mixture of secret composition exploited under preposterous claims.—*Jour. A. M. A., May 24, 1924, p. 1712.*

OBSERVATIONS ON SOME OF THE MORE
RECENT PROBLEMS IN RHINOLOGY*

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The history of medicine gives no more interesting record than that of the various troubles attributed at one time or another to nasal conditions. The rather complicated structure of the nasal cavities, especially those of the ethmoid, and the relation of these cavities and accessory sinuses to important structures such as the orbit, nerve trunks and the brain cavity, all combine to render plausible, or better perhaps, possible, some more or less satisfactory anatomical basis for explaining symptoms attributed to the nose.

The discussion over nasal reflexes which began in 1871 when Voltolini reported two cases of typical bronchial asthma cured by removal of nasal polypi, resulted ten years later in a flood of contributions to the literature discussing the subject of reflex nasal neuroses in which were expressed the wildest prophecies regarding the extent of the nasal relation to other diseases. There were those who seemed ready to believe that there was scarcely any ailment that might not be cured by treating the nose. Many rhinologists of those days accepted the view expressed by Bosworth that all cases of spasmodic asthma are associated with pathological conditions in the nasal cavities and, furthermore, that the source of asthma can always be traced to these nasal conditions. It is quite easy for all of us today to agree with the first of these propositions, namely, that all cases of asthma are associated with palpable evidence of pathological changes in the nasal cavities or sinuses, particularly if we are permitted to include such conditions as the usual irregularities of the septum and the ordinary turgescence of the turbinated bodies. The genuine enthusiast on nasal neuroses did not even stop at palpable evidence of abnormal conditions in the nose, but advocated the existence of hyper-sensitive spots in the mucous membrane of the septum and turbinated bodies in noses, that appeared on inspection quite normal, from which these supposed nasal reflexes might arise.

What was claimed in the eighties regarding the

relation between asthma and the existence of palpable changes in the structure of the nasal cavities, we can all accept regarding such conditions as headache, eye symptoms, various so-called neuralgic syndromes, migraine, and, indeed, any other condition we might care to mention. On the other hand, it is quite another matter to assume that the co-existence of two conditions such as palpable evidence of alterations in the complicated nasal cavities and such symptoms as headache, neuralgia, various eye symptoms, means, therefore, that these nasal conditions are causing the symptoms. In the discussions over asthma there were those who assumed that this condition was always dependent on some alteration in the nose, the correction of which would cure the asthma. This was clearly but one way of stating that the relief from asthma was dependent on the skill displayed by the rhinologist in his efforts to discover and to eradicate the causative nasal conditions, many of which appear to most of us more imaginary than real. It is at once apparent that such an attitude places the treatment of asthma in a most unsatisfactory state since it must inevitably lead to a great deal of misdirected, uncalled-for surgery.

The conscientious rhinologist who has a proper feeling for the responsibility which should be his of guarding the field of medicine for which he is sponsor, cannot but deprecate a teaching which leaves open a portal for indiscriminate surgery. This responsibility falls the more heavily on the properly qualified rhinologist today because this special field has, in recent years, been flooded by men who, after a few weeks' or months' attendance at clinics in our cities, have taken to operating on the nose and throat without any of the more important and much more difficult training for making careful examinations and for determining proper indications for surgical interference. In recent years I am encountering an increasing number of patients who have been subjected to unnecessary operations, usually upon the ethmoid and sphenoid sinuses, where we find no reason for believing that pathology had existed in these regions, cases operated for the relief of such conditions as typical, hereditary migraine and eye or ear symptoms which it would seem no stretch of the imagination should rationally connect with nasal sinus trouble.

It is always important to remember that reasoning post hoc, propter hoc, is often very misleading.

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It is just this sort of reasoning that supports osteopathic or chiropractic treatments or the wearing of the hind foot of a rabbit for the cure of rheumatism. To illustrate—because a patient suffering from a mild attack of acute catarrhal otitis media complicated by a facial paralysis which latter disappears in due time after the mastoid has been extirpated is no proof that the operation on the mastoid had any beneficial effect, for, as we all know, such cases of facial paralysis usually clear up spontaneously quite promptly on the subsidence of the catarrhal otitis media.

Let us inquire into some of the questions which have more recently been raised in rhinology. One of the first of these is the so-called vacuum headaches attributed usually to the frontal sinuses. The frequent rather narrow passage from this sinus into the nose, particularly when the naso-frontal duct opens into the anterior end of the infundibulum, makes the closure of this passage from acute swelling of the mucous membrane a rather simple matter. It is assumed that the closure of this duct takes place and is followed by the creation of a vacuum in the sinus and the development of pain over the sinus from negative pressure without inflammation of the membranes lining the sinus and without the accumulation of fluid in the sinus. How such headaches are made persistent because of chronic hyperplastic changes in the underlying bone, particularly of the unciform, has all been elaborated with great detail. The occurrence of such vacuum headaches cannot be very common since I have never been satisfied that I have encountered a case where the hypothesis of a vacuum within the sinus offered the most plausible explanation. What shall we say regarding the occurrence of the type of headache attributed to vacuum formation with the so-called sensitive Ewing's point over the orbital wall and where the skiagraph demonstrates the complete absence of any frontal sinus?

There is another question which I have found difficult to answer if we accept the vacuum hypothesis for frontal headache, and that is the failure to find these headaches in cases of advanced hyperplastic ethmoiditis where the development of polypi completely closes the middle meatus. It would appear that in just these cases where we are most certain of the closure of the naso-frontal duct the vacuum headache must be the rule. As a matter of fact, I have never found headache of any

type a frequent symptom of this condition. It is just cases such as these that question the validity of the whole theory of vacuum headaches. It would seem, moreover, from analogy with the obstruction to the Eustachian tube that the sinus would soon fill with a serous exudate, not a condition which in itself causes pain for it would not be a fluid under pressure, but a condition which would very quickly relieve any negative pressure. Sinus disease in which there is accumulation of inflammatory exudate within the sinus is a common symptom of sinusitis particularly when there exists an obstruction of the ostium. On the other hand, the occurrence of headaches independent of any palpable sinus disease is very much more common.

Some very interesting observations have been made on the relief of certain types of headaches by the application of cocaine or other analgesic agents, for example, to the region of the sphenopalatine ganglion. This phenomenon has been taken as an indication of the manner through which inflammatory disease of the nasal cavities produces involvement of the nerve trunk either by extension of toxins or of the inflammatory reaction through the bone or as the result of hyperplastic changes in the bone presumably setting up neuralgia through pressure on the nerve trunks. The fact that cocaine passes through the nasal membranes and affects the nerve trunk or ganglion is no reason for attributing the same penetrating faculty to the products of inflammation. In support of this hypothesis for the local cause of these neuralgias, the great frequency with which the membranes of the nose become the seat of acute inflammatory attacks is pointed out. In addition, an effort has been made to associate certain chronic, rather impalpable alterations in the nasal mucous membranes with the etiology of these neuralgias on the theory that these alterations in the nasal mucosa indicate hyperplastic changes in the underlying bone which in turn effects an injury to the nerve trunk. All of this is very interesting and while it is perhaps not easy to disprove, we must all admit that it is even more difficult to prove.

I have recently been studying a case with the typical sphenopalatine neuralgia syndrome and where an application to the region of this ganglion just back of the posterior tip of the middle turbinate body is quickly followed by a cessation of the pain. The patient has perfectly normal nasal

passages so far as I have been able to discern, nor is she in any way particularly susceptible to attacks of acute rhinitis. Now are we to assume that there is some often quite impalpable local change going on in the nose in such cases that extends to and involves the nerves? Why is it not more probable that the cause of the sphenopalatine neuralgia is the same as the more usual cause of neuralgia occurring elsewhere, not a local cause at all, but some focus of infection, placed at a distance from the nerve affected? Such an explanation would seem more logical than to assume a purely local cause acting in a manner quite unique for these particular nerve trunks.

All of these conclusions have a bearing on the problem of handling such cases. If neuralgias of the sphenopalatine are the result of the same cause as a neuralgia elsewhere then our first aim should be to search out and eradicate any existing focus of infection and resort to the local treatment of the ganglion only when the neuralgia is not relieved by these other measures which aim to eradicate the original cause.

When we add to these pain syndromes from the nerves occupying the bony wall of the nose the question of the involvement of the optic nerve because of its proximity to sphenoid and posterior ethmoid cells, the rhinologist is indeed confronted by a serious and difficult problem. In the first place, the ophthalmologists assert that they are not capable of telling just what cases of nerve involvement are caused by extension of sinus disease. On the other hand, the competent rhinologist is rarely left in doubt about the diagnosis of a sinus disease where this is associated with a suppurative process. But we are confronted by the proposition that the sinus disease may be a hyperplastic non-secreting disease of which the skiagraph gives no clue and for which neither anterior nor posterior rhinoscopy can give us any tangible evidence, unless, perchance, we use a peculiarly brilliant light and even then the evidence is so impalpable that few will be able to recognize the trouble.

These propositions demand the most serious consideration from the rhinologist for if they are entirely correct then it certainly is incumbent on the rhinologist in most of such cases, at least of optic nerve involvement, to operate on the posterior ethmoid and the sphenoid. The operation must be undertaken not only in those cases where a suppuration in these cells can be diagnosed, but even when

an absence of a suppurative process can be reasonably assured. This is, to say the least, not a very satisfactory position for rhinology. It is very much the same position in which rhinology found itself in the discussion over nasal reflexes in the eighties, for it opens the way, as did those discussions, to rather indiscriminate intranasal operations, with this exception, that the operations on the posterior ethmoid and sphenoid are much more formidable undertakings than the proposal for the relief of nasal reflex neuroses.

Let us inquire into some of the questions that arise in this problem of optic nerve involvement. In the first place, it is evident from the frequently demonstrated proximity of the optic nerve to the posterior ethmoid and sphenoid sinuses that inflammatory diseases of these cells might extend to injure the nerve. Do we not have an analogous situation when an involvement of the facial nerve develops in association with an otitis media? In the case of the facial nerve, it is apparently as often the extremely mild acute catarrhal process as it is the more severe suppurative disease that produces facial paralysis. Moreover, it is the acute processes that affect the nerve. Facial paralysis is never the result of the chronic, hyperplastic adhesive middle ear catarrhs nor is it often the result of chronic suppurative otitis media even where the hyperplastic changes in the mucosa and underlying bone are more conspicuous. Where it develops in chronic suppurative otitis media, it is usually the result of erosion of the canal walls by cholesteatoma or it is the result of sequestrum formation.

How these facts affect the problem of optic nerve involvement of nasal origin is quite obvious. Such involvement should be expected usually in connection with acute processes and not necessarily either the more severe processes. We should hardly expect nerve involvement from any chronic non-secreting hyperplastic process nor should we expect it to develop in the severe chronic suppurative process unless these conditions are associated with severe persisting headache indicating either retention or necrosis. The absence of nerve involvement in association with the chronic hyperplastic nasal process is quite in keeping with what we know of the bony changes in such processes. Beginning with the contribution of the English rhinologist, Woaks, attention has been directed to the bone changes in hyperplastic ethmoiditis. That such bone changes differ in any way from those that

result from periostitis in any other locality has not appeared. That these hyperplastic bone changes take place on the nasal aspect of bony walls cannot be taken as proof that similar changes occur on the opposite side of the bone, that is, on the orbital wall or the inner aspect of nerve channels. This is a problem still to be worked out.

When an optic neuritis occurs in connection with an acute sinusitis involving the sphenoid and possibly the posterior ethmoid is it desirable to subject all of these cases immediately to operative treatment? It has been urged in support of this procedure that some cases of optic neuritis proceed to recovery after the operation on the sinuses. But who can assure us that the improvement does not result in spite of the operation rather than because of this work? Do not many of these cases recover spontaneously on the subsidence of the acute sinusitis exactly as do most cases of facial paralysis that complicate the mild attacks of acute otitis media and that without any mastoid operation? Again, is not the recovery of the optic neuritis that occurs after an operation for draining the posterior ethmoid and sphenoid where we have clinical evidence of only a mild type of acute sinusitis quite analogous to the recovery of the facial paralysis in the mildest form of acute otitis media after there has been performed a quite unnecessary operation on the mastoid?

Gentlemen, I feel that all of these are pertinent questions which we should think over when we are confronted with a case of optic neuritis associated with an acute sinusitis.

In general, the logical conclusion would seem to be in acute cases of sphenoid sinusitis, the decision to operate should be made only after looking into the degree of nerve involvement on the one hand and the severity of the sinusitis on the other. Where either of these factors is severe, operate at once. When both are mild, do not be too hasty about operating since the probability is that there will be a spontaneous recovery in the course of a few weeks. When such recovery is not forthcoming, especially when there is a persistence of the sinusitis, the question of recommending the operation should be again seriously considered.

Now we come to one of the most serious of all the problems in connection with this question of optic neuritis and the occurrence of sinusitis. The ophthalmologist diagnoses a case of optic nerve involvement, the patient is referred to the rhinolo-

gist, who is unable to discover any palpable evidence of sinusitis or ethmoiditis. In spite of this negative finding, he is asked to operate on these sinuses because it may not be possible in all cases to positively exclude the occurrence of posterior ethmoid or sphenoid involvement. As proof that there existed an undiagnosed, undiagnosable sphenoid-ethmoid condition responsible for the eye trouble, it is pointed out that in some of these cases the optic nerve trouble subsides in time after the operation on the sinuses. But the matter is not so simple as all this, for in other cases in spite of the most radical operative measures, no improvement in the nerve takes place. Who shall say but that in those cases where improvement has followed an operation when no sinus disease could be discovered this improvement has not been in spite of rather than because of the operation.

There is another thought that arises in just such cases where the rhinologist finds no evidence of sinus disease. An acute involvement of the optic nerve even when this develops in the wake of an acute rhinitis, is no proof that such involvement occurs as the result of direct extension of inflammation or infection through the sinus walls. Only last week I had the opportunity of studying two cases, both occurring in young adult life, of acute neuritis of the eighth nerve. In one there was the history of a mild attack of coryza preceding the nerve involvement; in the other the only cause given by the patient was that she went out in the cold too soon after giving her head a shampoo. In both of these patients there was distinct evidence of focal infection both in the teeth and in the tonsils and the logical conclusion seemed to be that the latter was the important etiological factor in the development of the neuritis of the eighth nerve. The question naturally presents itself in acute optic neuritis when the etiological factor is obscure, even when the process is associated with an acute head cold but without palpable evidence of a sinusitis, may not focal infection be the important etiological factor? To my mind the two situations are quite analogous and it does not seem entirely logical to assume the existence of some impalpable, undiagnosable sinus condition as causing the optic neuritis when another explanation entirely different has to be assumed for the other. It has seemed to me that the importance of focal infection in the causation both of headaches, the sphenopalatine neuralgia, as well as of the involvement of the optic nerve

has been overlooked and that in the efforts to fix upon both of these conditions an etiology primarily rhinological, there has been a resort to hypotheses which are not only unproved, but are essentially unprovable, although one may not be able to disprove them.

These more recent problems that have come into the field of rhinology even though they may all eventually be put aside as having no great value have nevertheless already served a good purpose in stimulating a greater interest in rhinological work and have demonstrated in a most forceful manner the necessity of providing opportunity where men seeking preparation may be able to get something more than a smattering of operative technic while neglecting the more difficult and more important training in examination and diagnosis.

The conscientious rhinologist will guard with scrupulous jealousy the work in the field for which he is sponsor. He is not only anxious to avoid the risk of indiscriminate, unnecessary surgical work, but he is equally anxious to make sure that everything that is possible is being done for his patient. When such a serious condition exists as the loss of vision through an optic neuritis, the decision whether or not to operate should be reached only after consultation with the ophthalmologist, and, I might add, he should be ready to carry out any reasonable operative procedure even though he may be in doubt as regards the existence of a nasal cause.

NUGA-TONE

This is a nostrum sold on the mail order plan by a concern in Chicago called the "National Laboratory"—the latest name under which one Charles E. Cessna carries on mail order quackery. Nuga-Tone is described as the "Great Nerve and Blood Builder." It has been advertised in that class of weeklies sometimes described as the "cheap and nasty." The advertising does not tell just what is in Nuga-Tone. It does say that it is "rich" in iron and phosphorus, and also contains cascara and "nux." Further, one is told, "there are four other medicines" in Nuga-Tone. The death of a boy, three and a half years old, who had taken Nuga-Tone tablets in his parents' absence, is reported. When the death was brought to the attention of the National Laboratory, a formula was furnished which showed that each tablet contained 1/60 grain of mercuric chlorid, 1/60 grain of strychnin sulphate and 1/40 grain of arsenic trioxid. There is no law in this country which prohibits the indiscriminate sale of such dangerous nostrums. — *Jour. A. M. A., May 17, 1924, p. 1628.*

THE THIEF IN THE NIGHT—NON-INFLAMMATORY GLAUCOMA

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Stealthily creeping in, without outward visible sign or warning, to rob us of our most treasured sense, is the picture in his mind's eye, ever to keep before him, that every practitioner of medicine should have of simple, non-inflammatory glaucoma, for no more tragic affliction is the lot of man. Generally, one might say most frequently, unrecognized until well advanced, the most precious time for its combatment is only too often used up by the optometrist, and others untrained in ocular pathology and clinical ophthalmology, in repeated change of glasses—given with the opinion that the patient "is becoming far-sighted" or that "it may be an oncoming cataract," et cetera. And finally, only too late for help and after optic nerve atrophy is well on its way, the patient consults the oculist, whose sad and painful duty it becomes to tell that nothing can be done; and the unfortunate person must drift into the long night of blindness.

"Early recognition means everything. Late recognition or wrong diagnosis means loss of everything" (Fuchs). Although primary glaucoma, according to Fuchs, constitutes 1 per cent of all eye diseases, how extremely infrequently the general practitioner recognizes it or even suspects it only the well-occupied oculist is conscious of, and this, too, in cases of the inflammatory form. Iritis and iridocyclitis, in the presence of an inflamed eye, seem almost always thought of, and that diagnosis is generally made in most cases even if the patient is fortunate enough to be spared the catastrophe of having atropin put in his eye. How much more rarely, then, the non-inflammatory form, without a single outward objective sign, is even suspected, can well be imagined. Just such cases are the ones which, during the very time that something could be done for them to halt the dreadful malady, are glassed and reglassed by the optometrist and others without special training, only to lose steadily the remaining vision they possess. These cases, too, as we all know and are sad in the realization, go undiagnosed through the hands of careless and superficially working oculists,—the kind of refractionists who are satisfied with less

than normal vision in their patient without finding the reason why; who pass over accommodation inability in their patient without the compatibility of age or hyperopia; who are in too much of a hurry to take the field of vision when it is indicated; and whose dark-room observation is less than a careful, thorough, and searching examination of the anterior segment of the eye by oblique illumination and loupe, and the posterior segment of the eye (including lens, media, peripheral retina, macula and nerve-head, its color, size, margins, elevation, cupping and vessels and their behavior) with ophthalmoscope. Just such work has belittled scientific refraction, than which no branch of ophthalmology is capable of requiring more high training, good balance and sound judgment; this type of man's refraction takes no longer to do than the optometrist's, and in reality is not worth any more, and is responsible now for the growth and prominence of the optometrist and his kind in our midst.

A fact all oculists must ever impress upon themselves is that glaucomatous cupping with atrophy is too late for help. Cupping prior to atrophy is what we strive to find and it is our business to recognize it.

There are three types of cupping of the nerve-head: (1) physiologic; (2) atrophic (ordinary optic nerve atrophy); (3) glaucomatous.

Physiologic cupping is partial cupping, never total cupping of the entire breadth of nerve-head, nor deeper than the lamina cribrosa in its normal location. Any depth of the physiologic cup is due to its depth in the plump, heaped-up nerve-fibers, and the vessels do not emerge at the margin of the disc. The lamina cribrosa may be seen at the apex of the funnel but not across the whole width of disc at the floor of the cupping. On the other hand a total cupping of the entire breadth of nerve-head from margin to margin is always pathologic and must be either atrophic cupping or glaucomatous cupping.

The cupping of atrophy of the optic nerve, or so-called atrophy cupping, is a shallow, flat, white-bleached cupping never deeper than the lamina cribrosa in its normal location, and the atrophy is present before the cupping takes place; in fact, the shrinking or atrophy of the nerve-fibers makes all the cupping there is, with fenestrae of the lamina cribrosa exposed as a result of shrinkage.

The cupping of glaucoma, rather shallow at

first, is deeper than the normal location of the lamina cribrosa; is caused by its recession under intra-ocular pressure; and is there before atrophy of the nerve-fibers takes place; in fact, the after-coming shrinkage of nerve-fibers in the already existing cupping adds considerably to its depth. It is just at this stage where we as oculists should be on the job; that is, recognize the cupping (recession of the lamina cribrosa) before atrophy takes place and while the nerve-head is yet a healthy pink and the fibers plump; before the blue-green color appears and before the shrinkage adds to the depth of the already existing excavation and the exposure of fenestrae of the lamina cribrosa. After these are present it is too late for help. At this stage, before the healthy pink color fades and before the lamina cribrosa fenestrae are exposed by shrinkage, the proximity of the vessels to the very edge of the disc should immediately put us on our guard. Later the characteristic bending over and disappearance of vessels at the edge takes place, but this is generally found after the added depth of the excavation results from shrinkage.

Even in the presence of a well-defined glaucomatous change in the nerve-head in a hurried, superficial inspection, especially by indirect ophthalmoscopy, it is very easy to miss the telltale behavior of the vessels, which, reappearing at the bottom of the excavation, upon close examination, can be seen to have a different hue, and by paralactic displacement can be seen to be at a marked difference in depth. This, I repeat, can be easily missed except in detailed inspection by direct ophthalmoscopy, especially while the nerve-head is still pink in health and before atrophy has arrived.

Contracted arteries and slightly distended tortuous veins should immediately arrest the attention of the observer, for at this stage the recession of the lamina, prior to atrophy, does not include as yet a decrease in vision, and the time is even here at hand, by proper medical and surgical relief, to arrest and avert the atrophy which does mean loss of vision. Even in the presence of large, unmistakable pathologic cupping good vision and uncontracted fields may be found.

Of course the exception to this can be found in acute fulminating inflammatory glaucoma, where the pressure comes on so suddenly and acutely that destruction of life in the nerve-fibers takes place even before the lamina has had time to yield and recede. In this form of disease very often, if not

too prolonged, considerable recovery of vision may be found, but that it has suffered can be demonstrated in careful field-taking, by the presence of sectors or gaps reaching even to the macula or normal blind spot.

Ordinarily, then, estimation of glaucomatous damage can best be made not by the excavation but by the color of disc (pink color of health or gray-white of atrophy) and by the size of the arteries. The classic halo around the excavation is due to sclerosis and pressure-atrophy of the choroid; but this, of course, is a late, too late, finding.

Glaucoma—that is, inflammatory glaucoma—has been known from antiquity, and all the old writers have associated it or thought of it in connection with gout and arteriosclerosis. Simple, or non-inflammatory glaucoma, was never known or thought of in connection with the known (inflammatory) glaucoma until the advent of and since the progress of our knowledge from the use of the ophthalmoscope. Mueller first demonstrated glaucoma cupping anatomically in 1856.

Intra-ocular pressure and tension were first associated with glaucoma by Mackenzie and by von Graefe. Mackenzie relieved it by repeated paracentesis, but without permanent result. Von Graefe discovered, merely by coincidence, that iridectomy relieved it and in most cases with permanently good result, and this discovery proved to be one of the greatest advents in the history of ophthalmology. Von Graefe's declaration that the "essence of glaucoma lies in the increase of intra-ocular tension, from which all symptoms can be deduced," really stands unchallenged today and is the universally accepted idea of glaucoma.

Two chief divisions of glaucoma are: (1) primary and (2) secondary. Primary glaucoma comes on without any known antecedent disease. In this group are the inflammatory and the non-inflammatory affecting both eyes, generally one after the other in its start, but ultimately both. This class is the real glaucoma or the pure glaucoma. Secondary glaucoma is really merely a complication of tension in an already diseased or injured eye, resulting from the interference of exit of the intra-ocular fluids from the eye, and affecting only the eye in which the pre-existing disease or injury is present. It is merely an accessory and would not have come on except as a result of

such disease or injury. Secondary glaucoma is, of necessity, mostly an inflammatory glaucoma.

The common conception of the entrance of the optic nerve as through a round hole or opening in the sclera is entirely incompatible with a correct understanding of the pathology of glaucoma. There is not a gross gap or gross opening in the sclera at the point of entrance of the optic nerve. The scleral fibers are merely pushed aside like the slats of lattice work, offering a multiplicity of minute fenestrae through which the fibers in small groups pass into the eyeball, the so-called lamina cribrosa. Nevertheless, though the sclera is not grossly perforated, this spot is the one vulnerable spot in the event of intra-ocular tension, and this lattice work is the first to recede under pressure. The neighboring resistant sclera surrounding this lattice-work area affords a non-yielding ring over which the fibers, in their spray-like arrangement, pass in their distribution to form the retina. These fibers are broken and pinched by pressure until atrophy supervenes, which can be likened to a hernia which is strangulated in its unyielding hernial ring. Over these precipitous edges or eaves the vessels from and to the nerve-trunk are forced to take their course, disappearing over the eaves like drain pipes, and reappearing at the bottom of the cup or excavation. Late in the atrophy, through shrinkage of nerve-fibers, these small fenestrae of the lattice work can be seen, too, at the bottom of excavation. With the atrophy of the optic-nerve fibers which go to make the retina, of course loss of vision comes on; central as well as peripheral vision. The nasal field is first to suffer by reason of the temporal side of the retina being made up of the longest fibers from the nerve, and farthest from their center of nutrition, and consequently the most vulnerable in degeneration.

In order to present a comprehensive picture of glaucoma, it will be best to describe the acute inflammatory type, although not the type indicated by the subject of this paper, nor the type intended to be brought out in this discussion. Yet, as a starting point, all forms can be best visualized by shading up and down; up to the so-called malignant type which can strike suddenly and, unrelieved, can go on to complete and permanent blindness through a short and stormy course; and, shading downward, to the type which is the subject of

this paper—viz., the treacherous, unsuspected, non-inflammatory type—without outward sign to warn the patient or to indicate to friends, associates or even the medical man, the insidious, slow but sure oncoming blindness. For this reason, to repeat, it is seldom recognized until the fading vision from atrophy is upon us and beyond any medical or surgical help.

Promodes: A complaint of smoky vision and dull frontal headaches lasting a few hours, which may recur at intervals of a few days or even weeks or months, and which may be mistaken for presbyopic symptoms if the patient is in the forties, may be accepted as due to strain and symptoms of presbyopia alone. Recession of the accommodation near-point might not even put the oculist on his guard with these patients. An added complaint of halo or rainbows around lights with, ordinarily, a frequent necessity for increasing strength in reading glasses, jolts the eye-man into "attention" but means little or nothing to the optometrist or others untrained in the specialty. Generally these symptoms disappear during sleep and rest, and in the very mild inflammatory type these periodic symptoms may not increase much in severity for years, but all this time the optic nerve-head is leading up to atrophy. As these periodic spells recur, vision slowly recedes, accommodation lags and the victim is given stronger glasses. Usually, however, sooner or later an acute flare-up supervenes, after some gastro-intestinal disturbance, mental emotion, obstinate constipation, et cetera, and is ushered in by violent pain in the ears, the teeth, the head, and the region of the eye. Sleeplessness, anorexia, and maybe nausea and vomiting, are only too often accepted as acute gripe with neuralgia in the head. Then vision in the affected eye begins to fail; mere objects are only discernible; and at last the eye is recognized as the seat of trouble. Edema of the lids, chemotic conjunctiva, steamy cornea insensitive to the touch, with shallow anterior chamber and muddy, green iris, dilated, immobile pupil of peculiar green-gray color, oval or eccentric, and an obscured fundus and stony hard eye, complete the picture to the eye-man.

After a day or two or three, more or less, with treatment and sometimes without, the symptoms abate, tension recedes, the eye returns grossly to its usual appearance, vision seems to be restored, and patient goes on relieved for a time, sometimes for a long interval, sometimes for a short interval, and

the attack is repeated. After repeated attacks, however, return of tension to normal is impossible as a result of pathologic changes, and the eye goes into a chronic hard, painful and blind eye. Even though recovery seems, grossly at least, complete between attacks, close examinations show vision to have suffered, and it declines steadily, and the gray-slate-color-change in iris with exposed pigimentary layer at pupil edge, dilated anterior ciliary veins and porcelain-white sclera with sluggish pupil and optic-nerve cupping, make the classic picture. The degenerative corneal processes, scleral ectasia, calcareous lens and atrophy and shrinkage of the globe, form the picture of terminal, chronic, absolute glaucoma.

The above description is that of the entire course of the average primary inflammatory glaucoma, and though it starts in one eye and may long antedate its advent in the second eye, only too often the same process is repeated in the other, for it is regarded as a bilateral disease of advanced life in people of fifty to seventy years of age, most commonly of all among people of the Jewish race.

Shading down from the above picture, types of all grades are found, where symptoms are regarded as "billiousness," "neuralgia," "rheumatic headaches," et cetera; and we gradually come to the least manifest, but at the same time the most fatal form, the simple non-inflammatory form, "the thief in the night," the type that I heard one of the greatest of teachers of ophthalmology say would be about the only thing that, afflicting him, would make him a suicide.

The chief condition calling for differential diagnosis in the inflammatory type is, of course, iridocyclitis. Here we have generally a contracted pupil, but just there is the necessity for caution because glaucoma frequently complicates a former iridocyclitis with iris contracted down and held by adhesions, or even complicates an existing iridocyclitis; and the uncertainty in which we find ourselves as to the proper medication, atropin or eserin, puts us in the position of a person with a torch in one hand a fire extinguisher in the other, undecided which to use, generally concluding in the better judgment to use neither. In fact, the eye of every patient in middle life, or beyond, must be always approached with care and caution in the use of cycloplegics or even mydriatics. The instillation of even such a short-acting mydriatic as cocain has many times precipitated an attack of tension in eyes

that have previously never been known to have any disposition toward glaucoma. A careful eye-man will constantly guard against such ambush by using pilocarpin after the use of cocain, even for the removal of foreign bodies, in patients of such an age. An iridectomy in one eye has been frequently known to precipitate an attack of glaucoma in the opposite eye, adding to the distress of patient and attending oculist.

In general it should always be borne in mind that hyperopes with small, short eyes are chiefly the subjects of such tendency, while myopes with long eyes are rarely so disposed. In the use of all cycloplegics, patients of all ages should be close enough at hand for observation. Once in the experience of the writer acute inflammatory glaucoma was precipitated in both eyes of a young girl of twenty-two years of age by the use of homatropin. Fortunately she was under control, and within a few hours following the onset, vigorous treatment to combat the condition was instituted and proved effective; but such an experience is enough to last a lifetime. In my experience tension, too, has several times developed in cases of iridocyclitis after the use of atropin, where paracentesis and even iridectomy had to be resorted to to meet the emergency of sudden high tension.

It is an unwise and altogether unsafe practice to have patients living out of town continue to use atropin when they are out of reach and observation, and I know of patients who have suffered total and absolute blindness during the interval between trips to the oculist in the city.

In marked contrast to the inflammatory glaucoma described above, with abundant objective as well as subjective symptoms, is the simple non-inflammatory type, where the subjective symptoms are so slow and insidious as not to arouse even the patient until the effect of atrophy comes on, and where scarcely a single outward objective sign is manifested even to the alert and observing oculist. His contracting field is often not discovered by the patient because his central vision usually remains very good. The distended anterior ciliary veins around the cornea may be enough to arrest his attention, but even this is not prominently present until the condition is of rather long duration. Prior to the invention of the tonometer by Schoitz, of Christiania, glaucoma simplex was not known to be the result of raised intra-ocular tension, for the finger test by palpation could not determine it. In these

cases only repeated tonometer readings, sometimes repeated two or three times a day, are enough to establish the fact.

Just as slight continuous pressure in the dilatation of a uterine cervix by the water-filled placental membranes is more effective for complete dilatation in that structure than forceful instrumental dilatation of short duration, likewise the continuous, constant low-pressure of the slightly raised intra-ocular tension of simple non-inflammatory glaucoma is more fatal and sure of excavation and atrophy in the optic nerve-head than the high-pressure of a violent inflammatory glaucoma attack of short duration. Moreover, an acute attack is so adequately relieved by a properly performed iridectomy that since von Graefe's institution of that procedure the inflammatory type has largely lost its terrors to the ophthalmological world. On the other hand recognition of the simple non-inflammatory type is almost always so long delayed that almost any and all procedures, surgical and medical, are dismally ineffective and of no avail. As a consequence, announcement of the presence of the simple non-inflammatory type in a given case has the effect of a funeral pall upon us all, and utter hopelessness and despair engulf even the most optimistic youngsters as the result of their reading and teaching, and surely stirs no hope in older men of years and experience. Nevertheless I believe, and I am sure that all of us believe, that the pathology of all forms and types of glaucoma is fundamentally the same, and that if the simple non-inflammatory type could only be recognized as early, antedating atrophy, as the inflammatory type, its relief could and would be just as sure and effective as in the latter.

Let us all, then, be alert in the recognition of the pre-atrophy stage, the stage where the recession of the lamina cribrosa is to be made out on careful inspection; where the cupping can be seen to reach from margin to margin, but before the healthy pink color fades and before the atrophy coming on additionally deepens the excavation and exposes the fenestrae in the lamina as a result of the shrinkage of the fiber bundles. If we are alert at this point and proper medical and surgical relief is instituted, there is no doubt that the malady can be arrested as certainly as in the inflammatory form.

Sometimes the simple form flares up into the inflammatory. It would be fortunate if it always did, for then it would be recognized. For, while the

inflammatory form of primary glaucoma is almost always a disease of middle or advanced age, the simple non-inflammatory type only too often claims its victims from among the comparatively young adults, adding to the tragedy.

The inflammatory reactions of iridocyclitis and glaucoma are different in that the former, when severe, is attended with plastic exudate, while that of glaucoma is distinctly the serous or water-logging process of strangulation. In the purely glaucomatous inflammation of the eye hypopyon or pupillary exudate is not found, a very important point of differentiation between the two diseases. The clouding of the cornea, too, is caused by this same water-logging condition and quickly disappears upon relief of the strangulation, which is not the case in corneal inflammation or keratitis.

The essential condition in all types of glaucoma to be borne in mind is the interference or blocking of the exit of intra-ocular fluid from the eye at the angle of the anterior chamber, be it as a result of a swollen or thickened lens, a congested and enlarged ciliary body that presses the root of the iris forward to the cornea, or to a general hyperemia and edema of the whole intra-ocular tissue, or to the presence of exudate or disintegrated blood elements smearing over and clogging the filtering structure of the ligamentum pectinatum and Schlemm's canal. The effect is the same, viz., a disturbance of balance between the incoming and the outgoing fluids of the eye resulting in pressure and strangulation of retinal structures which eventually atrophy and perish.

The only communication from the posterior chamber to the anterior chamber of the eye is through the circumlental space, and in case this space is impinged upon by a disproportionately sized lens as a result of swelling, the lens acts as a valve seated against the ciliary processes and iris base. The increasing pressure thus pushes these structures forward, jamming the angle of the chamber and shutting off the exit of intra-ocular fluid from the eye.

The most favorable factors for this condition are a small eye, shallowness of anterior chamber, a large ciliary body and a disproportionately sized lens. Towards all of these we have a tendency as age advances in the originally hyperopic eye, and in many instances only the added peripheral thickening of the iris when dilated is necessary to pre-

cipitate the blocking of exit for the fluids, and the strangulation sets in.

Iridectomy for relief of glaucoma should always be done as early as possible by making section well into the sclera, rather than in the cornea, and should be as broad as possible and to the very root of the iris. Where regional atrophy exists in the iris, the iridectomy should be done in the least atrophic part, for in this region it will be more effective in opening the angle of the chamber. The various forms of sclerotomy, including trephining, have not proved as dependable as the broad iridectomy, and even in the simple non-inflammatory form the latter would, no doubt, be the most dependable if it could be done in early recognized cases. The action and benefits of myotics in the medical treatment, of course, are to be seen in the drawing away of the peripheral folds of the iris at the angle of the chamber such as takes place in active contraction of the iris. Eserin and pilocarpin can be efficacious only where the iris muscles are capable of contracting, surely not where atrophy of that structure makes such contraction impossible. The action of myotics should be welcomed only as a tide-over and not as a substitute for proper surgical relief, for when their effect wears off the tension is likely to return. The liberal use of myotics before operation is a great help. Tension may be partially relieved, anesthesia may be more effective, and the operation is rendered far easier in performance.

Infantile or juvenile glaucoma, hydrophthalmus, buphthalmus or ox eye, is distinctly a disease of childhood, and like glaucoma in the adult is also caused by intra-ocular pressure, due to an obstruction of the avenue of exit of the intra-ocular fluids; but the pathology primarily is, in all probability, a congenital absence or relative absence of the normal drainage passages known as the canal of Schlemm, or an impervious ligamentum pectinatum, and is not due to obliteration of the angle of the anterior chamber from encroachment of the adjacent iris, as in the ordinary adult type of glaucoma. During the years of early childhood the sclera and cornea are relatively soft and yielding, and as a result give way before the increased intra-ocular tension. The eyeball enlarges to tremendous size; hence the popular name, ox eye. The outer supporting coats, almost alone, take part in the enlargement, and as a result the intra-ocular structures, especially the lens, are proportionately small. The

sclera of characteristic bluish-white, the strikingly large cornea, deep anterior chamber, the shreddy, tremulous iris and the prominence of the globe, make diagnosis easy. Examination of the nerve-head will disclose the glaucomatous cupping. The process can go on to enormous size with ultimate total blindness, or, as is frequently seen, it stops spontaneously with some remaining vision, but the eye remains disproportionately large and disfiguring. It may be unilateral, but usually is bilateral. The lens is often loosely held by its ligament, which is either partially or entirely ruptured, and becomes cataractous, and drops to the bottom of the vitreous chamber.

SAN-I-SAL

Newspaper advertisements have appeared during the past month or two advising the obese public of "A Guaranteed Way to Take Off Two to Five Pounds in One Bath." The product advertised is "San-I-Sal, the Pine Hot Springs Bath." It is sold by the San-I-Sal Laboratories, Washington, D. C. The advertising claims are typical of "patent medicine" obesity cures. According to the specifications of a patent granted by the U. S. Patent Office, the "invention" is said to relate to "a composition of matter for producing a medicated bath of particular value in the treatment of obesity." The "composition" is stated to be: epsom salt 90 per cent, baking soda 2 per cent, table salt 5 per cent, Canada balsam 2 per cent, oil of pine needles 1 per cent. The specifications also declare that the substance used in the bathing water has been found to afford "great relief in cases of inflammatory rheumatism and ailments of a similar character." That a mixture of epsom salt, baking soda and table salt with a small quantity of Canada balsam and oil of pine needles should be granted a patent by the U. S. Patent Office as a new and useful invention, makes one wonder just how much intelligence on medical subjects there is displayed by the Patent Office. —*Jour. A. M. A., May 31, 1924, p. 1800.*

LIPOSAN

According to the advertising, Liposan is "a Vegetable Lipoidal Solution" which has chaulmoogra oil as its "medicinal element." Liposan is claimed to be "indicated" in "Abscesses," "Acne," "Anemia," "Arthritis," "Agitans," "Boils," "Bubo," "Cancer," "Chorea," "Cystitis," "Eczema," "Erysipelas," "Furunculosis," "Herpes," "Hemiplegia," "Ivy Poisoning," "Myalgia," "Neuralgia," "Neuritis," "Peritonitis," "Pylorrhea," "Infantile Paralysis," "Pneumonia," "Rheumatism," "Synovitis," "Syphilis," "Salt Rheum," "Tubercule," "Tonsillitis," "Ulcerations (Indolent)," "Varicositis." The proprietors, Hoffman and Hicks, have not requested an examination of Liposan by the Council on Pharmacy and Chemistry, and so far the A. M. A. Chemical Laboratory has not examined the product. A physician will be justified in his refusal to accept the unproved claims of the manufacturer. He might be justly criticized were he to administer intravenously a product which, so far as he knows, is unstandardized and of wholly questionable value.—*Jour. A. M. A., May 3, 1924, p. 1462.*

MENTAL RE-EDUCATION IN THE SERVICE OF MEDICINE

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Psychotherapy has always been intrinsic to the art of medicine. In the distant past, healers had their charms and amulets. The medicine man of our own American Indians, as of many other primitive peoples, had a psychotherapy, which was one of fright and fury. The fine type of general practitioner we have heard idealized through the past two centuries was the embodiment of a beneficial mental influence, which comes legitimately to the aid of scientific medicine in its war on both organic and functional disease.

With the different stages of medical progress there has been a corresponding amount of insight into the mental factors of sickness, and varying therapeutic methods for dealing with such manifestations have accompanied medical development. During the last twenty years the knowledge of the nature and causes of "nervous" disturbances has been revolutionized. The war neuroses have recently contributed to a general interest in such conditions. From this, and from many other sources, psychotherapy has gained a more intelligent base of operations. At present, among the most effective measures it employs is that of re-education; this signifying the giving to the patient knowledge regarding his own make-up, his moods and his motives, and likewise training him, as an individual, up to his maximum of what Dr. Adolf Meyer has aptly expressed "constructive composure."

The older order of treatment of the minor functional troubles presented a great range of variation. Sometimes an exhortation, or clapping of the unfortunate "neuropath" on the back, was followed with a tonic or with the assurance that nothing was wrong. On the other hand, there was considerable urging the patient to get well solely by dint of will and conscience, and without any knowledge of himself. Or frequently the physician, in paying careful attention to a rather unimportant physical abnormality, fixed a neurosis on an organ that had hitherto largely escaped the patient's notice. The doctor thus became, professionally, a factor in the production of a more chronic disability. It often happened that the physician himself summarily condemned the patient, ignoring those phases of

the situation which might be subject to improvement. A spirit of denunciation made the patient on the defensive and apologetic from the start. Sometimes this assumed the form of an exaggerated hypochondriasis, or self-depreciation, with real bewilderment. On the other hand, many times it bred an over-compensatory attitude of belligerency and dissatisfaction with the physician, to the detriment of the profession as a whole. It also provided the basis for the development of various present-day cults. These cults flourish on the emotional ills of the people, aided and abetted by the failure of the medical profession to meet psychic as well as physical needs of patients. Fortunately, better methods are gradually superseding these unsatisfactory forms of therapy, which were born largely of ignorance. No adequate teaching of medical psychology had been given in the medical schools. The physician's ignorance of psycho-dynamics, plus the pressure of his work, could not help but breed a most discouraged state of mind medically. Even now, in the gradual development of medicine, one too often finds the physician giving more time to a trivial physical disability than to a complex personality disorder. The patient himself is making strenuous, if unsuccessful, efforts to understand himself and needs the help of one who might be called an intelligent personality interpreter, who can make the patient himself understand the balancing, as well as the conflicting mental factors present in his make-up.

A physician who honestly devotes effort to analysis of personality is able to offer definite practical help to harmonious readjustment for living. With the sincere effort of the physician to face the patient's life situation, a corresponding ability comes to the patient, who previously had feared to meet reality. In fact, the overdeveloped measures of defense, such as hypochondriacal complaining, defiance, and doubt, are born of fear, and when courageously challenged are susceptible of control.

At the basis of any sound psychotherapy there must be specific insight into the condition. The well-known English neurologist, Buzzard, says, regarding this: "Born of the needs of the consultation room, within the past twenty years the science of history-taking for physical and later for mental disorders has been assuming its appropriate importance. On the physical side this has been accepted without demur, but on the mental side it has been met with a volume of resistance which only time

and education are slowly breaking down." As one of our own leaders, Dr. White, has expressed it, "The method of estimating the patient's condition by what he is pleased to volunteer regarding it, has been found increasingly less satisfactory. Conscientious physicians are no longer content to take as final the patient's account of his discontent, his nervousness, sleeplessness, or general indifference, any more than they are willing to let a cough go uninvestigated."

With a proper inquiry into the causes underlying a "nervous" upset, there follows, in the logical treatment of the condition, a systematic enlightening of the patient with regard to his own make-up, and training to efficiency.

The process which marks a therapeutic change is a very dynamic one and alive with the keenest of life's intensities. The term "transference" is serving a useful purpose at the present time in describing that part of the process which deals with the personal relationship of patient and doctor. The physician forms a buffer between the patient and the world, and is the first recipient for new formed attitudes of mind. There are infantile habits to be changed, and poorly conditioned reflexes to be replaced by new ones. The method of attack has to be definite; no generalities or platitudes will be of use. While the physician is oftentimes in a passive rôle, yet ultimately his rôle must be an inquisitorial one. He has to be quietly on his guard, ready to enforce his points at the moment required, remembering, however, that much brilliant conversation is useless with hysterical or neuropathic patients; they are interested in themselves, not in another person. Through "therapeutic tact, rapport, experience," or what you will, the physician is able to give the patient a new moral balance, a broadened sense of obligation, or, in other words, a practical philosophy of life, suited to his abilities.

In this treatment of the individual, rather than the apparent disease, and in this temporary domination of personality over personality, oftentimes really remarkable reorganizations of lives can be effected. Unhappy, maladjusted people learn to drop their frantic, panicky, misdirected struggles, through which they are fleeing from their weaknesses and handicaps. With increasing success they become able to control their emotions and activities, and enter into normal social relations again, gaining the capacity to maintain a healthy, active attitude in the face of difficulties.

From time to time, physicians specializing in this type of work have put forth some constructive idea that they have elaborated in the process of re-education of patients. Recently two physicians, at different ends of the country, whose time has been devoted chiefly to psychotherapy, have each published a book containing suggestions of value regarding the process of personality reorganization. The reference is to Dr. Jackson of Pasadena, California, and Dr. Gehring of Bethel, Maine. The titles of their books are, respectively, "Outwitting Our Nerves" and "The Hope of the Variant." These books have in common the idea that intelligent self-knowledge given to patients is a powerful help in promoting their reinstatement to social efficiency, and that people can, in a large measure, choose the moods, emotions and activities that go for healthy and happy living. Dr. Gehring's work was precluded several years ago by Herrick's "The Master of the Inn," a book written from a patient's experience and point of view.

In Dr. Gehring's present study, the personality of the variant, or potential neuropath, is said to be within the wide range of nature's normal zone. The author shows that the variant can obtain a calm state of mind and cultivate a sturdy, optimistic attitude toward obstacles. Such a one must learn that many of his worries and chronic fears are born of a faulty habit of comparing himself, detrimentally, with others, which can be replaced by the quieting feeling of security that he only has to know and be loyal to the best in himself. One particularly suggestive point Dr. Gehring has studied out is that obsessive concepts come through the channels of feeling, and that they can be modified and often made to disappear by the process of getting them formulated or crystallized into words.

Dr. Jackson's book deals more explicitly with instincts and emotions, which she explains are the well-springs of behavior. These lie deep in each individual's personality and are bound up with much custom, tradition, and a variety of thought processes called rationalizations; the purpose and result of these latter being to justify, on supposedly intelligent grounds, the individual's instinctive course of action. One secret of self-control is in adjusting the receptive portions of the instinct mechanism, so that the threshold is less egotistically sensitive than is that of a neurotic. This process can be made possible through re-educational effort. She speaks of what "vital importance it is to society

that its citizens should be taught to solve their inner conflicts and keep well; at the top notch of vitality with well digested food, well slept sleep, well forgotten fatigue, and well used reserve energy." She speaks reassuringly of the day of the long term sentence to nervousness being past. The book has done, and is still doing, good work in the hands of large numbers of patients.

Throughout present day medical literature there are innumerable short articles on the same general subject. The appended bibliography, used in the preparation of this note, gives an indication of how widespread are the tributaries of this current medical development.

In concluding, the broader implications of the subject may be mentioned. Re-education is, in reality, but one aspect of that larger problem of education which faces each one of us. Progress is accomplished through specialized effort becoming more readily available in the service of different fundamental obligations confronting each member of the "responsible generation." One does not need to find himself a professor of medicine, or such an exalted being as a member of a committee on medical education, or even a representative of a special branch of medicine, to take note of such considerations; for the challenge comes to each physician, parent, teacher and friend, to do what he can to further honest and ungarnished self-knowledge and purposeful social accomplishment.

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ZINC-BOROCYL NOT ACCEPTED FOR N. N. R.

The Council on Pharmacy and Chemistry reports that, according to the Al-Sano Chemical Products Co., Zinc-Borocyl is a definite chemical compound. The label of the trade package gives "boridiorthotic oxybenzoic acid zinc" as a synonym for Zinc-Borocyl, but it also declares that the product which is marketed is not the substance to which the name "Boridiorthotic oxybenzoic acid zinc" is applied, but that "the contents of this bottle represent a concentrated solution" of this product. From the information furnished the Council and the statements on the label and in the advertising, it may be concluded that "Zinc-Borocyl" is a solution containing the so-called zinc borosalicylate in undeclared amounts. Its exploitation is essentially an attempt to introduce an old German nostrum—Mucosan—to American physicians under a new name. Zinc-Borocyl is offered as a germicide, antiseptic and astringent, and is recommended for a host of conditions. The Council declared Zinc-Borocyl inadmissible to New and Non-official Remedies because (1) its composition is not correctly declared; (2) it is an unoriginal preparation marketed under a proprietary noninforming name; (3) the recommendations for its use are not upheld by acceptable evidence, and (4) the available information fails to show that the product claimed to be zinc borosalicylate has any advantage over established zinc salts.—*Jour. A. M. A., May 24, 1924, p. 1712.*

FERRASSIN NOT ACCEPTED FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Ferrassin is marketed by Robert Wollheim in the form of tablets and capsules. They are said to be composed of "Vegetable Iron," "Peptonized Iron and Manganese," "Plant Albumin," and Milk Sugar. No information is furnished in regard to the composition of "Vegetable Iron" or of "Peptonized Iron and Manganese." Ferrassin was declared inadmissible to New and Non-official Remedies because its composition is secret and it is marketed with unestablished and unwarranted claims.—*Jour. A. M. A., May 24, 1924, p. 1712.*

THE USE OF CONCENTRATED FOODS IN THE FEEDING OF INFANTS AND CHILDREN*

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In the past few years far-reaching investigation has been carried on in the feeding of infants and young children with concentrated food. Such feeding, however, does not constitute a new procedure; for foods of high caloric value which could be given in relatively small amounts have been used for years.

However, it is not until a comparatively recent date that any food other than the most dilute mixtures of milk has been used in feeding premature and new born babies. This has been true because of the established belief that these infants lacked the ferments requisite to the proper function of digestion. But late research shows that protein, carbohydrate and fat ferments are present in the gastro-intestinal tract very early in fetal life, pepsin having been found in the gastric mucosa even as early as the fourth fetal month. During the fifth and sixth months lipase and trypsin appear, while hydrochloric acid, rennin, secretin, erepsin, steapsin, maltase, diastase, ptyalin, invertin and saccharase have all been found at various later months. Lactase is one of the last ferments to occur and is therefore absent in some prematures, but makes its appearance at once when food is given. It can be said that all the necessary ferments are present at birth or as soon thereafter as food is administered, since food acts upon the ferments directly as a stimulant.

Lack of ferments then is not a cause of the difficulties and peculiarities of digestion in new-borns, but rather the cause is physical frailty. Prematures are naturally weaker than full term babies and in their feeding it is of highest importance not to overtax their physical capacity. Therefore it is essential to stress the principle of quality in solving the problems of feeding of prematures and new-borns.

In the solution of feeding problems of weak babies other than new-borns and of young children who are frail, the use of foods rich in nutritive

*From the Miller Hospital Clinic and the Pediatric Department of the University of Minnesota Medical School.

*Read before the Medical Forum, December 6, 1922.

value which could be given in small quantities is not a new thing. Two such foods are Keller's malt soup and thick cereal feeding. The former was valuable not only because of its composition but also because considerable nutrition could be given in small volume. Ingredients: one-third litre of whole milk, 600 grams of water, 100 grams malt extract, and 50 grams flour. The value of thick cereal feeding in pylorospasm and pyloric stenosis has long been firmly established, since in these conditions it is especially important that the retained food be of high caloric value. The many excellent results reported have shown the wisdom of this food even in spite of the fact that starch may cause severe disturbance in infants and young children.

Among the present day preparations receiving most attention are:

1. Thick cereal mixtures with the directions given by Sauer forming a basis for various formulas as used by Graves, Chapin, Mixsell and others. Sauer's directions: To 9 ounces skim milk and 12 ounces water add 6 tablespoons farina and 3 tablespoons Dextri-Maltose. Cook until thick.

2. The Dubo of Schick, whole milk with 17 per cent sugar.

3. The concentrated eiweiss of Finkelstein, prepared as the original eiweiss without the addition of water, plus 10 to 20 per cent carbohydrate.

4. The Czerny—Kleinschmidt butter-flour mixture. Ingredients: 7 grams butter, 5 grams sugar, 7 grams flour, 100 c.c. water. To be mixed with milk as indicated. For ease of preparation three times these amounts can be used. The butter is heated in a pan over a slow flame until bubbles appear and any odor of volatile fatty acid has disappeared. To this the flour is now carefully added and both ingredients again gently cooked with continuous stirring until they become a thin, smooth brown mixture,—to which is added the previously warmed water in which the sugar has been dissolved. The mixture is again brought to a boil, strained and then added to the desired amounts of milk.

5. The butter-flour whole milk and the butter-flour cereal of Moro. The butter-flour whole milk is composed of: 5 grams of butter, 3 grams of flour, 7 grams of sugar, and 100 grams of whole milk. This is prepared much the same as C.-K. butter-flour mixture except that the volatile fatty acids are not driven off by heat.

The butter-flour cereal is made with: 5 grams of butter, 7 grams of flour, 5 grams of sugar, and 100 grams of whole milk. This is boiled to a cereal and fed with a spoon.

In the discussion of the value of the concentrated feedings there is much of interest. That the thick cereal feedings are of decided value in pylorospasm most investigators agree. Since the work of Sauer many results have been published. That it has a quieting effect on a sensitive, irritable pylorus there is no doubt. It also prevents aerophagy, which is an important element in the production of habitual vomiting. Also due to its composition it cannot be vomited as easily as the thin mixtures. Preliminary gruel feedings often stop a mild vomiting in breast fed infants in a day or two. As a complemental feeding to the breast fed infants who do not thrive in the first six months it is excellent because it adds several carbohydrates to the diet in concentrated form without the giving of much fluid. Its use, however, is limited to those infants without a nutritional disturbance. Many pediatricists claim that breast fed infants take the gruel feedings earlier than those artificially fed because the breast milk furthers the digestion of the starches. In exudative diathesis of the edematous form it allows the giving of food without the additional amount of fluid. In constipation it adds bulk and may be very laxative if sufficient carbohydrate is added. In chronic bad feeders good results are published by Chapin, Mixsell and Graves. Chapin reports a series of twenty cases of marasmus treated with whole milk mixtures, with the addition of flour and sugar in various proportions, in which the results were for the most part good and an analysis of the stool showed an assimilation of carbohydrate almost comparable to that of normal children. Graves had good results with thick cereal mixtures made with farina and cream of wheat, which he prefers because of their property of expansion, making a thick mixture with the addition of a minimum amount of starch. He lays emphasis upon the examination of the stools. However, the presence of starch in the stools if symptoms of colic are absent is not of great importance. In normal nursing babies an insufficient supply of breast milk may be supplemented by the cereal feedings, and the infant who receives solid food early in life has a firmness and an excellent muscle tone that is lacking in babies kept too long on a milk diet only. The early feeding is also an

advantage in paving the way to the easy addition of other foods when the time comes.

Results with the Dubo feeding (whole milk and 17 per cent sugar) are published by Schick, Schick & Helmreich, von Groer, Heller, Davidson and Lust. Schick uses this preparation in the new-born ward and gives the infants food on the first day of life. His results are very good. The so-called physiological loss of weight is usually prevented and many gain from the first day. Vomiting is not frequent. The stool changes from a meconium to a food stool on the second day of life. As soon as the mother's milk can be obtained in sufficient amounts the substitute feedings are omitted. Heller, following the teaching of Schick, had good results in prematures; he found the food excellent due to the small amounts necessary to produce growth. Beginning the feedings a few hours after birth, he found that loss of weight could be prevented and that new-borns show the same tendency to rapid growth as the fetus if only enough food is given. However, he agrees with Von Reuss that they must have the ability of water retention. After the new-born period his best results are with Dubo as an additional feeding to human milk. With Dubo given alone his observations show three stages: marked thriving, weight at a standstill, and loss of weight. This was after weeks of continued feeding. Schick emphasizes that the tolerance of the child must be carefully watched if the feedings are to be given over long periods of time, and that as soon as any dyspeptic symptoms appear a lowering of the food to the minimum is necessary and then a gradual return to the optimum. Lust had excellent results with new-borns. He knows no artificial food that gives such excellent gain in weight, and finds it even better than breast milk. But he finds that the percentage of children who go over into dyspeptic conditions after its long continued use is not small. In combination with breast milk his results were good and dyspepsia was seldom seen. Von Groer had excellent results in the acute infectious diseases and dysentery, with Dubo plus the other concentrated foods.

In the Czerny-Kleinschmidt butter-flour mixture the authors attempted to make a food very similar to breast milk in composition. The fat and carbohydrate percentages are kept high and the protein is low. The carbohydrate is partly starch which is dextrinized by heat in the preparation. They lay stress upon its value as a food owing to:

(1) the driving off of the volatile fatty acids; (2) an amount of flour equal to that of the fat; (3) chemical alteration of the flour; (4) the high carbohydrate and fat percentages; (5) the low protein. They advise the food for young and premature infants much below weight who have not been made to thrive on other foods, having a special value alternated with breast milk. They do not recommend it for infants with acute digestive disturbances, with or without fever.

Not all agree that much of its value lies in the fact that the volatile fatty acids are driven off by heat. Moro especially argues against this point, and in his butter-flour whole milk we have a preparation with the same ingredients as the Czerny-Kleinschmidt formula but in the making of which the volatile fatty acids are not driven from the butter. The relation of fat to carbohydrate is as 1:1.7, which is the same as that of human milk. The results reported by Moro and his followers are quite as good as with the C.-K. preparation.

As a standard artificial food for all cases no preparation can be discussed as such. High fat, high sugar, and high protein formulae have their limited uses, but none take the place of human milk in infant feeding. When we consider that many artificially fed infants thrive on very rich mixtures it becomes evident that the powers of assimilation vary within wide limits. This is as a rule for short periods of time only, for sooner or later a high percentage of these children show symptoms of dyspepsia. For good thriving a food must contain at least the minimum requirement of all elements necessary for growth. This was not true of the old third milk mixture and its use has practically been discontinued in all clinics. High fats and high proteins are usually well borne for long periods of time and the onset of dyspeptic symptoms is slow. With the high sugar feedings the onset of any disturbance is usually rapid and a return to the normal is usually accomplished in a few days by a low carbohydrate feeding. The stage of repair after an exceeded tolerance with fat is usually slower. In the using of the concentrated preparations it becomes necessary to raise the percentage of fat and sugar beyond what was formerly regarded as safe for infants and young children. We know now that these high percentages can be given if we maintain a fairly definite relationship of the elements. High fats can be given with perfect safety if we raise the carbohydrate. This

knowledge has been used by Czerny and Kleinschmidt in their butter-flour mixture, and by Moro in his butter-flour whole milk. Following another well founded principle that high carbohydrate can be given with a high protein percentage, Finkelstein made his concentrated eiweiss milk. The reason for the success of the Dubo of Schick is also partly due to the high protein content of cow's milk.

We must also consider growth with the concentrated foods. Until the last few years the amount of fluid required for the thriving new-born was thought to be that quantity taken in breast milk. The work of Schick and Helmreich and that of Heller has shown that growth is in every way normal with the fluid reduced one-half. With a triple concentrated food growth took place equally well. The urine, however, became only a few cubic centimeters in amount, dark in color, and often showed traces of sugar. The temperature at times was elevated. These symptoms disappeared with the giving of more fluid and this fact is often used as an argument against the limited giving of water. For healthy infants with a good appetite who will take large quantities there is no reason for this limitation. It is in the dystrophic cases that the more concentrated preparations have their place. It is the under-nourished, non-thriving infant who needs much food. This has long been recognized, but to administer this amount of food has been the problem because of the dilutions used. These cases often have a bad appetite and are prone to vomit. With an increase in the quantity of food the vomiting increases and the condition becomes worse. With the thick preparations many of these cases show rapid improvement. In a recent paper Finkelstein says that we must free our minds of the traditional view that infants in a state of dystrophy cannot take foods without high dilutions. He also points to the work of Schick with Dubo and says that sugar is not to be feared as a cause of fermentative diarrhea and toxic conditions as was formerly believed. However, the fact remains that these infants do remarkably well on preparations where much nutritional value can be given in small quantities. Extra fluid can be given between feedings if it is the hot time of the year and necessary for the comfort of the patient.

SUMMARY

Food which can be given in small volume is indicated in:

A. The well child:

1. Those who need to be fattened.
2. Those with lack of appetite.
 - (a) New-borns and prematures.
 - (b) Anorexia.
 - (aa) Of nervous origin.
 - (bb) Following an acute illness.
3. In infants with intertrigo and maceration of the skin due to constant wetting of their clothes.
4. In enuresis.

B. The sick child:

1. With anorexia—the influenzas.
2. Those with continued vomiting.
 - (a) Nervous vomiting.
 - (b) Pylorospasm.
 - (c) From severe coughing.
 - (aa) Pertussis.
 - (bb) Pneumonia.
 - (d) In acute infectious diseases.
3. Those with difficulty of taking food.
 - (a) Sore throat.
 - (b) Dyspnea—pneumonia, croup, diphtheria.
 - (c) Disturbances of cerebral function—typhoid and meningitis.
 - (d) Tetanus.
4. In diarrhea.
 - (a) Typhoid.
 - (b) Dysentery.

As contra-indications:

1. The healthy child who needs volume to satisfy the pangs of hunger.
2. Cases of acute vomiting and diarrhea of alimentary origin.
3. When children cannot be under absolute control.
4. Not to be used over long periods of time but as a therapeutic measure only.

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PREGNANCY WITH COMPLICATIONS:
FIBROIDS; ECLAMPSIA; CESAREAN SEC-
TION; ACUTE GASTRECTASIA; THROM-
BOPHLEBITIS: CASE REPORT

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The patient, aged 32, presented herself at the end of the first trimester. Aside from the present illness, the history is without interest. She believed herself to be pregnant, having menstruated for the last time on October 18, 1921. Previous to that she had had menstrual flow of moderate amount occurring regularly every twenty-eight days, lasting for three days without pain. At the first examination she complained of slight frequency of urination, poor appetite, occasional nausea and headache. The physical examination disclosed a nodular mass in the pelvis interpreted as an enlarged uterus probably of pregnancy with hard fibroid tumors through its body. The patient was carefully observed each month and the diagnosis corroborated. The blood pressure, urine and general condition remained entirely normal throughout the first eight months. At this time she suffered from false labor pains and was sent to the hospital on the suspicion that delivery might take place. The family was instructed that abdominal cesarean section might be necessary because of the fibroid condition of the uterus. As the pains stopped, however, the patient returned home. When seen ten days later, the urine and blood pressure were normal.

On July 21, 1922, three weeks after the false labor, the patient noticed spots in front of the eyes and a short while later had a convulsion. The blood pressure at this time was 160/120. Abdominal cesarean section was performed and a living baby delivered. Following the operation, the blood pressure was 140/100. She was placed on morphin and chloral hydrate, and after a small temporary rise in blood pressure, the tension fell on the following morning to 136/88 and remained in that neighborhood. On the second postoperative day, she complained of great distress and 32 ounces of a dark brown fluid containing flocculent material was removed from the stomach. An attempt was made to insert a Rehfuß tube, but the patient could not swallow it; so the stomach was washed out through a stomach tube with water containing 2 grams of tannic acid. Five minims of pituitrin

were given hypodermically every six hours. This resulted in a slight rise in blood pressure, but gave the patient much relief. At the same time enterocolysis was started. On the tenth postoperative day, the temperature was elevated and the cervix was dilated. The fever dropped in three days, but on the fourteenth postoperative day, the patient complained of pain in the left calf. Several small masses were distinctly felt near the surface, and the limb was raised and surrounded with ice caps. The thrombophlebitis was completely relieved by the sixteenth postoperative day and the patient left the hospital on the twenty-second day. Unfortunately, in spite of the care of capable pediatricists, the baby died on the fourteenth day.

The presence of fibroids in the uterus is a subject which requires careful consideration as to prenatal care and management of the delivery. The uterus on exposure in this case showed such a multiplicity of nodular growths that for this condition alone, cesarean section would likely have been necessary. In addition to the larger growths which could be palpated through the abdominal wall there were many (perhaps 200) smaller masses scattered over the entire surface and planted in the various muscular layers of the uterus which had not been palpated previous to operation.

Among other things, eclampsia has been attributed to infarct formation in the placenta with absorption of the autolyzed tissue. In this case, there was present on the surface of the placenta an area approximately three-fourths of an inch in diameter which showed degeneration, and might probably have been loosened at the time of the false labor pains, since previous to the actual appearance of the convulsions there was little indication of eclampsia. There is a difference of opinion as to the treatment of choice in eclampsia, though it may be said that operative treatment certainly offers a lower mortality to the infant and perhaps also to the mother over the expectant treatment. If operation is to be performed, it should be done not later than six hours after the first convulsion.

Acute gastrectasia is a not uncommon condition, though its presence is usually an indication of a weakened patient, since it most frequently occurs in patients in poor condition. Its mortality is variously estimated at from 50 to 75 per cent. The seriousness of this condition is easily offset by early recognition and prompt treatment. The stomach tube has long been recommended as the most effi-

cient remedy for gastrectasia. The action of the tannic acid which was utilized in this case serves to coagulate the blood and stop bleeding points in the gastric mucosa, in addition to acting as an astringent. Pituitrin acts as a stimulant to smooth muscle, thus serving to bring the stomach to its normal size and function. Repeated small doses extend this effect over a longer period of time.

The slight retention of lochia on the tenth day resulted from the insufficient dilatation of the cervix and secondary to this was the thrombophlebitis which occurred in the left leg. It is well to watch for retention in cases which have been delivered via cesarean section, since seldom has the cervix been dilated and the lochial flow may be slightly checked. The severity of the thrombophlebitis may be aggravated by failure to recognize the source and promptly eliminate it.

There were two indications for cesarean section in this case: first, the fibroids in the uterus, and, second, the eclampsia. Conditions tending to infection contraindicate this proceeding. Vaginal examination had been done early in the onset of gestation and strict hygiene had been observed, so that the possibility of infection was so slight as to justify immediate operation. It might be questioned why the Porro cesarean section was not done, but the patient's condition would not warrant it.

TERSUL-HILLER NOT ACCEPTED FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Tersul-Hiller (Robert Wollheim, distributor) is a German preparation of silicon and calcium proposed as "An Adjuvant to the Treatment of Tuberculosis, Rachitis, etc." Physicians are told that Tersul-Hiller is "composed essentially of coincidentally water-soluble silica and water-soluble calcium salts as shown by the following approximate percentage formula: Silica (new process) $4\frac{1}{2}$ gr., calcium lactate $7\frac{1}{2}$ gr., calcium hypophosphate $\frac{3}{4}$ gr., calcium phosphate $7\frac{1}{2}$ gr., calcium fluorid $1\frac{1}{2}$ gr., calcium carbonate 60 gr., magnesium phosphate 3 gr., milk sugar 15 gr." From this formula it would appear that Tersul-Hiller is a mixture containing a silica compound of undeclared composition and a mixture of soluble and insoluble calcium compounds—chiefly calcium carbonate. The Council found Tersul-Hiller inadmissible to New and New-official Remedies because (1) there is no acceptable evidence for the therapeutic use of silica preparations; (2) the identity of the silica compound is not declared; (3) the use of the mixture is irrational, and (4) the claims for its therapeutic effects are unwarranted.—*Jour. A. M. A., May 24, 1924, p. 1712.*

A CONSIDERATION OF POSTOPERATIVE COMPLICATIONS FOLLOWING THYROIDECTOMY

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A review of the literature on surgery of the thyroid gland disclosed very little data on operative complications and treatment following thyroidectomy, practically all articles dealing with surgery of the thyroid being on preoperative treatment, actual technic, or end-results. In view of the fact that the recognition of such complications and treatment have such a definite bearing not only on the immediate, but on the ultimate results, I reviewed the case histories in the Mayo Clinic with regard to the postoperative complications of about two thousand patients on whom thyroidectomy had been performed for exophthalmic goiter and adenomatous goiter, and personally observed approximately two thousand more.

The purely surgical complications following thyroidectomy fall naturally into two definite groups: (1) those due to a pathologic condition present at the time of the operation, or to a coincident surgical complication developing after operation, and considered unavoidable; and (2) those that are accidental and dependent on the technic of the operation and the personal skill of the operator; these may be considered avoidable in the majority of instances.

Group 1.—Among the unavoidable complications, "collapsed trachea" has been held responsible in many cases in the past. This condition is a definite clinical entity usually occurring in cases of large or hard, nodular goiters. It⁴ is caused by softening of the tracheal rings, the result of pressure. The trachea is held patent by the fascial attachments to the enlarged gland. Thyroidectomy removes the supporting structure, and if there is severe erosion of the tracheal rings, collapse may follow. The inciting cause of the collapse may be rotation of the trachea during operation, pressure from edema, or hemorrhage in the surrounding tissues, or the inspiratory effort, causing the walls to fall together, and act as an obstructive valve. These complications may occur during operation or within a few hours after. Some years ago, difficulty in breathing following such operations was

ascribed to collapse of the trachea, the responsibility of which was not assumed by the operator. In recent years, however, it has been learned that such dyspnea rarely is due to collapse of the trachea, but usually to some other condition. In none of the cases in this series which came to necropsy, could the cause of death be ascribed to collapse of the trachea. When it does occur, immediate tracheotomy, to avoid death by asphyxiation, is necessary. The trachea must be supported either by a tracheotomy tube, sutures, or packing, until sufficient adhesions have formed to hold it patent.

Tracheitis and laryngitis, with the edema of the trachea and larynx, are present to a certain degree in a large percentage of cases following thyroidectomy. This is the result of manipulation, of mechanical injury to the trachea because of its immediate proximity to the field of operation, and of alteration of the blood supply in this area. The closer and more extensive the association between the thyroid and the trachea, the greater will be the reaction. In most instances, the reaction will be mild and transient, manifesting itself by an increased amount of viscid mucous sputum, and a thick, hoarse voice; it may, however, be much more serious. The onset of the edema in this type of case is usually within two to four hours after operation. The patient gradually becomes hoarse, and breathes with increasing difficulty. Injury to the recurrent laryngeal nerve may or may not accompany this condition. Laryngoscopic examination will reveal edema of the larynx and the trachea and vocal cords; in some cases the air passage will be narrowed markedly. This condition rarely, if ever, progresses to the point of operative interference unless accompanied by injury to the recurrent laryngeal nerve. The constant inhalation of steam with compound tincture of benzoin affords the greatest relief to these patients. The patient should be entirely inclosed in a tent, so that he will constantly breathe an atmosphere saturated with steam. In twenty-four hours the patient will usually be markedly improved.

Occasionally coincident surgical conditions may be included under the heading of unavoidable complications, although they are naturally rare. Two cases were noted in which acute appendicitis developed within forty-eight hours after a thyroidectomy. The patients were operated on and convalesced uneventfully, although there must have been a very definite increase in the operative risk.

In a case of acute cholecystitis with stones following thyroidectomy for exophthalmic goiter, the patient was treated medically and carried through the postoperative stage. Another patient developed definite signs of intestinal obstruction a few days after the original operation, but symptoms subsided before operative interference was necessary. Menstrual complications are sometimes distressing, and, though not dangerous, may definitely prolong convalescence. One patient had a flare-up of an old salpingitis several days after operation. The condition was treated for about three weeks, when operation was performed.

Group 2.—Among the accidental complications that are dependent on the technic and skill of the operator, paralysis of the vocal cords, due to injury of the recurrent laryngeal nerve, is by far the most serious. From the standpoint of complications and the relation to operative risk, such injuries are of two types: transient paralysis,¹¹ the result of pressure or manipulation of the recurrent laryngeal nerve, and permanent paralysis,³ the result of clamping, cutting, or ligating the recurrent laryngeal nerve. The first type, which has little effect on the convalescence, may be manifested by partial or complete abductor paralysis of the vocal cord. It is sometimes difficult to determine whether this is due to local edema, or to partial or temporary nerve injury. The paralysis usually clears up in from one to three weeks. If the recurrent laryngeal nerve is cut, clamped, or ligated, there is complete paralysis of the corresponding vocal cord, which is usually permanent. In a few cases in which the nerve is only torn or crushed, regeneration may occur, and the vocal cord return to normal after several months. The paralysis may be either unilateral or bilateral; it has a definite bearing on the immediate convalescence, and on the future well-being and happiness of the patient.

Injury to one nerve may result in definite hoarseness, or there may be no perceptible change in the voice. There may or may not be signs of obstruction to breathing. If dyspnea is present, it is usually complicated by local edema. Regardless of whether or not this is the case, the convalescence of the patient is usually definitely protracted. Examination of the vocal cords may reveal the cord on the side of the injured nerve fixed in the abductor or in the cadaveric position, and without movement on attempted phonation. However, with one normal cord there is not sufficient obstruction to

affect materially the every-day life of the patient after recovering from the operation. The voice usually approaches the normal as the other vocal cord hypertrophies in accommodation. There is little doubt, however, that in the presence of unilateral vocal cord paralysis,⁸ there is a definite increase in the mortality in event of complications such as a crisis, pneumonia, or acute infectious disease.

Bilateral vocal cord paralysis⁵ due to injury to both recurrent laryngeal nerves is a serious complication. The immediate effect on the voice is not always the same. The patient may still be able to talk, but with a peculiar, characteristic, brassy type of voice. When once heard, this type of voice will always associate itself with paralysis of the vocal cords. The patients may or may not have immediate partial obstruction to breathing. If it does not occur at once, it usually develops to some degree within twenty-four hours. Frequently dyspnea, and at times stridor, are the only symptoms. Laryngoscopic⁷ examination of the vocal cords of this type shows both cords fixed in the abductor or median line position with a very narrow slit between them for the passage of air. Patients must be watched carefully, by an experienced nurse, as their surgical risk is greatly increased. Any transient, acute infection might be sufficient to cause death. A tracheotomy tray should be kept in the room, and all in readiness for tracheotomy at a moment's notice. Steam with compound tincture of benzoin should be in constant use with the patient in a tent.

Another type of bilateral cord paralysis is not as distressing, or as serious from an immediate standpoint. The patient has complete loss of voice and talks in a loud falsetto whisper. There is no obstruction to breathing. Drinking water causes a very distressing choking. This is followed usually by coughing and straining. Laryngoscopic examination reveals fixation of the vocal cords in the intermediate or cadaveric position. There is no motion of the cords when talking is attempted. Although there is no obstruction to breathing, the possibility always exists that it may develop suddenly. Here also it is wise to have a tracheotomy tray in the room in preparation for emergency. After a prolonged convalescence the patient usually goes home feeling fairly well except for loss of voice and a tendency to dyspnea on slight exertion. Examination of the vocal cords after a few months

will show them to be contracted to the abductor position. Patients gradually learn to talk in a weak, cracked voice, but are unable to lead a normal existence because of the ever-present dyspnea caused by slight exertion. They may be semi-invalids for years, always living in fear of exerting themselves and of the possibility of a complete obstruction to breathing. Sooner or later attempts must be made to alleviate this condition.

In connection with injuries to the recurrent laryngeal nerve it may be well to mention hysterical aphonia, which should be distinguished from injury to the nerve. The onset may follow operation directly, or it may not arise for several days. In most instances, the voice returns spontaneously. Laryngoscopic examination will at once differentiate this from true vocal cord paralysis.

Hemorrhage following thyroidectomy is another very important accidental complication. There are two distinct types: one occurring within the first forty-eight hours; the other delayed, manifesting itself from ten to twenty days after operation. The first is by far the most serious. It has a very definite effect on the convalescence of the patient, and unless apprehended and arrested early, may be the direct cause of death. If there is an unusual quantity of blood in the dressings, requiring changing more than once or twice in twenty-four hours, the patient should be watched closely for hemorrhage. Seeing the wound with the dressing off will usually determine whether or not the drainage is excessive. If the flow of blood becomes a steady dropping or a small stream, the wound should be opened and the hemorrhage stopped. The bleeding usually comes from a branch of the inferior thyroid artery, from one of the lateral veins, or from a general oozing of the tissues. Undoubtedly the slipping of a ligature during a coughing or vomiting spell is directly responsible for it in many cases.

Hemorrhage⁹ occurring early following thyroidectomy may be accompanied by clot formation. It is much more common and dangerous than the former type. It is caused by slipping ligatures, small vessels overlooked at operation, vessels crushed and starting to bleed during a coughing or vomiting spell, or a general capillary oozing. There are several characteristic symptoms which should be recognized early. The first is practically always mentioned by the patient himself. If he complains that the dressing is getting tight, the wound should be examined. If the bleeding is not apprehended

at this stage, it is usually progressive. The symptoms, as the clot grows larger, occur in the following order: difficulty in swallowing, feeling of a lump in the throat, difficulty in breathing due to pressure on the trachea, and finally complete loss of voice. These symptoms are undoubtedly due to a combination of pressure on the recurrent laryngeal nerve, pressure on the trachea, and the resultant traumatic edema of the surrounding structures. If the symptoms are progressive and the condition not recognized and relieved, the patient will go on to asphyxiation and death. Prompt opening of the wound, evacuation of the clot, and ligating of any bleeding points, or, if none can be found, packing of the wound, will relieve all symptoms with very little increase in the mortality rate.

Late postoperative hemorrhages occur but rarely, and then only in the presence of a particularly virulent type of wound infection. One case was noted in which the hemorrhage occurred on the fourteenth day. The patient had an infected wound and had been having hot dressings. The character of the drainage had become serous, and the patient was dismissed from the hospital. He was brought back on the fourteenth day, bleeding profusely from the wound. Operation disclosed the offending vessel to be a large branch of the inferior thyroid artery which had been eroded by the infection. The vessel was ligated, and the patient recovered uneventfully.

Edema⁶ and ecchymosis of the skin flap do not form a dangerous complication, but may definitely prolong convalescence. The edema itself rarely affects more than the flap. The ecchymosis, however, may be widespread, and involve all the wound area and a greater portion of the chest wall: thus the wound drains longer, and in case of contamination a fertile field for infection is afforded. Sterile hot dressings should be applied every two to three hours for several days.

Infection of the wound is not common, but when it does occur, it assumes a variety of forms and may result in protracted and long drawn out convalescence. Practically all wounds following thyroidectomy were drained. In a few cases, gauze packs were used, and in a few others, wounds were packed with gauze and left open. Following the sero-sanguineous drainage of the first few days, the character of the drainage changes to serous. Cultures of the wounds in this type, taken from the tenth to the fifteenth day, showed either streptococ-

cus or staphylococcus in large numbers. In most instances patients recovered uneventfully without general symptoms of infection. From the standpoint of effect on the convalescence, such wounds cannot truly be considered infected. In a second type there was a sero-purulent drainage. In these, also, cultures were positive, but they usually cleared up after a moderately extended period of drainage. In a third type the infection was more severe, with a frankly purulent drainage. Cultures in most of these cases showed *streptococcus hemolyticus*. Such wounds require sterile hot dressings applied every two to three hours for a considerable period. In the fourth type the wounds drained very little or none, at first. The temperature varied from 100° to 103°, and there was a general feeling of intoxication. The wound was indurated, and somewhat swollen, and the flap reddened. Hot dressings usually produced a purulent drainage within a few days. *Streptococcus hemolyticus* was present. The fifth type is very rare and apparently is caused by an extremely virulent type of organism. The drainage is purulent and profuse with marked sloughing of the flap, causing an ugly scar when the wound heals. Because of the preponderance of operations for goiter in women, the appearance of the scar becomes important. A good scar, in the opinion of the patient, may mean the difference between a very successful operation and a mediocre job. Ugly scars are practically always the result of extensive infection. It¹ is a simple matter, after the wound has healed, to excise this scar tissue and approximate the skin and muscles. Keloid formation is not common, but when present it can usually be controlled by mild doses of x-ray. The skin may sometimes be attached to the trachea at the point of drainage; swallowing causes an elevation of the skin at this point. If this still persists two or three months after operation, daily massage of the neck with cocoa butter will often cause stretching of the scar tissue so that it will not be noticeable. If this does not improve the condition, excision of the scar and approximation of the skin and muscles will remove the deformity.

Air embolism occurs infrequently, and is an operative, rather than a post-operative complication, the result of tearing a large vein, or failure to ligate properly the lateral veins. Three cases occurring on the operating table have been noted. If a large vein is open, air may be sucked in during inspiration. The symptoms are those of cerebral

anemia accompanied by a cessation of respirations, and if correctly interpreted early, prompt lowering of the head of the table and ligating the vein will always bring these patients through. The complications occurred in cases of large adenomatous goiter with enormously distended and tortuous lateral veins. All the patients recovered.

Tetany² as a postoperative complication is now far less common than in the past. It is the result of removal of part or all of the parathyroid bodies, or of interference with their blood and nerve supply. Since the days of complete lobectomy, it is very unusual to remove the parathyroid glands during a thyroidectomy. However, since the adoption of resection rather than complete removal of the thyroid gland, most of the cases are due to interference with the blood or nerve supply. There are two very definite types of postoperative parathyroid tetany, transient and permanent. In the transient type, which is undoubtedly due to interference in the blood or nerve supply to the gland, a heavy milk diet, and calcium lactate by mouth, will usually cure the condition in a few days. For the attack itself, 5 c.c. of a 10 per cent solution of calcium chlorid intravenously will produce immediate relief. In the permanent type treatment with calcium chlorid and parathyroid extract will hold off attacks, but cessation of the treatment is soon followed by their recurrence. In this type there is definite and permanent injury to the parathyroid glands, or to their blood supply. There were no cases of permanent tetany in this series.

Myxedema is an unusual sequela of thyroidectomy. It is caused by the removal of too much gland tissue, infection of the wound with resultant sloughing and destruction of gland tissue, or by the presence of a thyroiditis at the time of operation. The medical treatment of this condition with thyroid extract and thyroxin will re-establish a normal rate.

The incidence of purely medical complications is mentioned chiefly to emphasize the additional complications which must be dealt with. The accompanying symptoms and their treatment will not be discussed in detail.

The crisis of exophthalmic goiter, or the onset of acute hyperthyroidism following operation, is not nearly so common as formerly. When it does occur, the usual treatment of heavy doses of Lugol's solution,¹⁰ digitalis, icebags, forcing fluids by rectum and subcutaneously, with nothing by mouth,

and the liberal use of morphin to combat the restlessness, are the chief forms of treatment.

Acute dilatation of the heart is rarely found except in crisis. Digifolin hypodermically or intravenously seems to be the most desirable form of digitalis. Auricular fibrillation is the usual rather than the unusual condition in the severely toxic cases. Auricular flutter is much more infrequent. The usual treatment by morphin, ice cap to precordium, and digitalis is used.

Pneumonia as a complication is rare, since the use of local and combined anesthesia. It is practically always of the bronchial type and rarely fatal. Alone it does not constitute a very markedly increased risk. In the presence of injuries to the recurrent laryngeal nerve and subsequent vocal cord paralysis, however, the risk immediately goes much higher. The complications of pneumonia, such as dry pleurisy, pleural effusion, or empyema, must be dealt with as such. There is a definite increase in the mortality if these occur early.

Acute follicular tonsillitis sometimes occurs. One case in particular is mentioned because of the fact that the patient, on being questioned, insisted that his throat was not sore. His throat therefore was not examined in the search for the cause of his toxic condition, and the condition was overlooked for twenty-four hours. On examination, the throat was found to be acutely inflamed. The usual hot saline irrigations and steam inhalations suffice to take care of this type of complication.

Most types of acute infectious diseases have been seen at one time or another. Nothing more can be said than that isolation of the case and treatment of the condition must be instituted. The risk is, of course, definitely increased.

Phlebitis following thyroidectomy is rare, and with it there are usually coexistent varicosities. One case was noted. Treatment consisted in rest, elevation, and heat to the limb. Recovery was uneventful.

SUMMARY

The present day interpretation of surgical complications is radically different from that of ten to fifteen years ago, especially with regard to complications causing interference with respiration. We know that practically all of these are due to injury to the recurrent laryngeal nerve, or to pressure on the trachea from clot formation in hemorrhage. Many surgical complications do not markedly

affect the mortality rate, since they are promptly recognized and treated. The most serious of the complications from the standpoint of mortality and the future welfare of the patient is injury to the recurrent laryngeal nerve. The accurate checking by laryngoscopic examination is the only method of determining the degree and type of involvement of the vocal cord; on this, the prognosis depends.

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A little more than fifteen years ago, on Memorial Day, a wreck on a trolley line at Elyria, Ohio, caused the death of sixteen passengers and sent half a hundred others to a small local hospital in an old residence. The lack of adequate facilities caused the death of a number, among them Homer Allen, a high school boy, son of Edgar F. Allen, a business man of Cleveland, but a resident of Elyria. The utter inadequacy of the hospital to meet any emergency, its incompleteness even for ordinary conditions, greatly impressed Mr. Allen. It did more; it caused him to resolve to give up his million-dollar business and devote his energies, time and money to ameliorating suffering. He headed an organization to provide Elyria with a hospital that would meet all present and future needs. Large, fine grounds were purchased, and a modern hospital, costing \$100,000, was built. He gave liberally himself, besides proving himself a splendid solicitor. The town was rapidly growing from a beautiful village to a manufacturing city, and five additional units to the hospital have been built. Today the outlay represents \$1,000,000. Mr. Allen assumed the general management without salary, and when the monthly balance showed a deficit he made it up from his own pocket.

About ten years ago a local physician remarked casually that something ought to be done for the crippled children of the city. Mr. Allen thereupon investigated and found that the United States possessed only three crippled children's hospitals, one at Canton, Mass.; one at Haverstown, N. Y., and a third at St. Paul, Minn. He learned all he could of the work being done, but he doubted whether there were enough cripples in Elyria or in the county to justify the erection of a hospital exclusively for them. Investigation, however, soon brought to light twenty young cripples in the city and more than 200 in the county. Mr. Allen's interest grew, and he employed at his own expense a capable woman to survey several nearby cities. He found there was one cripple to every 500 of the population. He

has since found through surveys in many large cities that there is a crippled child for every 400 of the population. This would indicate no less than 325,000 in the whole country. Soon after the county survey was made Mr. Allen presented his findings to the Hospital Board of Elyria and urged the building of a crippled children's hospital, to be placed upon the ample grounds of Memorial Hospital. The request was a distinct surprise and it was doubted if the community could at that time add this unit, but so great was the confidence in Mr. Allen that he was told to proceed with the scheme, if he could raise the money. A single donor gave \$25,000 as a memorial to her husband, W. N. Gates. In this way the Gates Children's Hospital was founded.

The Edgar Allen idea of local rather than large State or regional hospitals is based upon the economy of the small hospital or ward. They should be in connection with large hospitals to secure the advantage of trained nurses, good medical attendance, nearness to the children's homes and the avoidance of red tape. The academic and industrial education with a vocational turn adapted to the child's possibilities after leaving the hospital has developed wonderfully in some of the cities. It is found advisable to establish day schools for their special benefit in the larger cities. Cleveland has 138 such children in day schools and is preparing for 250 more now on the waiting list. Cincinnati has 120, Toledo 125, Akron 37, with 90 on the waiting list, and so on through a long list of smaller cities. What a contrast this picture presents to that of European cities, where begging cripples line the streets! Not all children can be discharged from the hospitals fully cured or normal, but none is accepted unless he can be benefited. To make the work more effective Mr. Allen is now stressing the need of convalescent homes to relieve the hospitals after operations and to provide better educational facilities and more homelike surroundings.—*Current History*, April, 1924.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS
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EXAMINATION

BY EXAMINATION

<i>Name</i>	<i>Medical College</i>	<i>Address</i>
Arthur, Francis Harding.....	U. of Minn., M. B., 1923.....	St. Barnabas Hosp., Mpls.
Carlson, Harold Wesley	{U. of Minn., M. B., 1922} {U. of Minn., M. D., 1923}	Henry Ford Hosp., Detroit, Mich.
Colberg, Ernest Johnson.....	U. of Minn., M. B. & M. D., 1924.	St. Peter, Minn.
Gupte, Vasant S.....	U. of Minn., M. B., 1923.....	St. Mary's Hosp., Duluth
Jacoby, Lionel Arnold.....	U. of Minn., M. B., 1923.....	1917 Emerson Ave. S., Mpls.
Kitchen, Hubert Daniel.....	U. of Manitoba, M. D., 1921.....	Rochester, Minn.
Lapp, Victor Roy.....	McGill, M. D., 1921.....	Rochester, Minn.
Noble, Thos. Paterson.....	U. of Edinburgh, M. D., 1913....	Rochester, Minn.
Rasmussen, R. Carl.....	U. of Minn., M. B., 1922.....	St. Mary's Hosp., Duluth
Settelen, Max Ernst.....	Basel, Switzerland, 1921.....	Rochester, Minn.
Travis, Walter T.....	Cen. U. Ky., M. D., 1907.....	Ely, Minn.
Wheeler, Dan, Wilbur.....	Rush, M. D., 1923.....	Nopeming, Minn.

BY RECIPROCITY

Blackstone, Geo. R.....	N. W., M. D., 1900.....	Eveleth, Minn.
Campbell, John Wm.....	Rush, M. D., 1897.....	Fargo, N. D.
Counseller, Virgil Sheetz.....	Rush, M. D., 1920.....	Rochester, Minn.
Dies, John Livengood.....	U. of Pa., M. D., 1918.....	Rochester, Minn.
Griffith, Guy Evertt.....	N. W., M. D., 1920.....	709 Duff Ave., Ames, Ia.
Griswold, Lincoln Bon.....	Loyola, M. D., 1923.....	60 S. Lincoln Ave., Aurora, Ill.
Hargis, Estes Henry.....	U. of Pa., M. D., 1921.....	Rochester, Minn.
Harrington, Ethel R.....	Rush, M. D., 1917.....	Rochester, Minn.
Killins, Wendell Allensworth..	U. of Neb., M. D., 1921.....	Rochester, Minn.
Merrill, Elmer Forrest.....	U. of Mich., M. D., 1920.....	Rochester, Minn.
Monnich, Walter Arthur.....	Baltimore Med., M. D., 1910.....	108 Buckingham Apt., Mpls., Minn.
Myers, Fred Earl.....	U. of Pa., M. D., 1921.....	Ely, Minn.
Parker, Stephen Thos.....	Creighton, M. D., 1921.....	Rochester, Minn.
Parson, E. Lillian Bendeke....	U. of Ill., M. D., 1923.....	Elbow Lake, Minn.
Randall, Laurence Merrill....	U. of Ia., M. D., 1921.....	Rochester, Minn.
Sansing, Campbell	Tulane, M. D., 1895.....	427 6th St. S. E., Mpls., Minn.
Simon, Harold Ewart.....	U. of Pittsburgh, M. D., 1922....	Rochester, Minn.
Swanson, John Albert.....	U. of Louisville, M. D., 1921.....	Lowry Bldg., St. Paul
Sweetser, Horatio B., Jr.....	Harvard, M. D., 1921.....	2509 Pillsbury Ave., Mpls., Minn.
Underhill, Marshall Scott.....	N. W., M. D., 1921.....	Rochester, Minn.
Veirs, Ruby Jayne Smith.....	U. of Louisville, M. D., 1920.....	1541 Lincoln Ave., St. Paul, Minn.
Wheeler, Roy McMillan.....	N. W., M. D., 1900.....	3980 Lake Park Ave., Chicago, Ill.

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EDITORIAL

Homeopathy

Chapters in history come and go and often the close of the chapter is only realized in retrospect. The chapter in medicine which deals with homeopathy is from all appearances rapidly drawing to a close.

Ask the recent medical graduate what he knows about homeopathy and in all probability all he can tell you is that one of the former schools of medicine prescribed on the theory that like cures like and that drug potency increases with dilution; that neither of these theories work out in practice and that's that. He never heard of Hahnemann's third theory of the "psora" or miasm, which was supposed to manifest itself in some form of skin disturbance. As a matter of fact this third theory never attained much credence among his most ardent followers.

The German physician, Hahnemann, first propounded his theories at the close of the eighteenth century. It was then known that quinine was a specific for malaria and the thought occurred to Hahnemann that quinine administered to the normal human being might produce a reaction similar

to malaria. He tried it on himself. It did. Ergo—*similia similibus curantur*.

Hahnemann's theories gradually spread all over Europe in spite of temporary adverse legislation in Austria and later in England. In no country did these novel ideas find such fertile soil as in our own. Towards the end of the last century homeopathy was flourishing and at its close there were twenty-one homeopathic medical schools in operation in America. Few of the present generation can realize the foothold homeopathy gained among the profession in this country nor the heated debates it caused in our ranks.

Today, just two homeopathic medical schools exist in this country and last year just forty-nine physicians of the school were graduated. Homeopathic physicians who wish to be known as such are comparatively few in number. Homeopathy has come but is now obsolete.*

What is the explanation of the fall of homeopathy? The main reason lies in the fact that in the light of modern scientific medical progress the theories of homeopathy do not hold water. Quinine destroys the *plasmodium malariae* in the blood and is not an instance of like curing like.

The power of publicity in remedying conditions is nowhere better illustrated than in its effect on homeopathic medical schools. In 1901 the American Medical Association began publishing a yearly list of medical schools in the country and their ratings. Since then the number of homeopathic medical schools has rapidly decreased from twenty-one to two. So many of the homeopathic schools had low ratings that together with the falling off in patronage they became discouraged and quit. Many a homeopathic physician realizing the true state of affairs sent his son to a regular school.

Homeopathy has made its contribution to medical progress. If it accomplished nothing else, it counteracted the practice formerly in vogue of administering large doses of drugs. Patients in many instances did as well or better on the almost negligible medication of this school. The present day tendency away from useless medication is doubtless the result of the influence exerted by the school of homeopathy.

*In the June issue of The American Mercury, Morris Fishbein presents the subject of "The Rise and Fall of Homeopathy" in an unbiased and very illuminating manner.

"Dr." Henry Ford

The feeling of criticism of the methods pursued by the management of the Ford Hospital on the part of the medical profession of Detroit attained some publicity when the Detroit Academy of Surgery declined the invitation recently to hold a meeting at the hospital.

As explained in the local medical society bulletin, "The medical profession objects to having Henry Ford, a man of unlimited wealth and power, a man who controls a publication, a man of strong prejudices, practice medicine by proxy."

The story goes that some years back Mr. Ford received what he considered an exorbitant bill for medical services rendered a member of his family. This experience is supposed to have been the inspiration for the establishment of his hospital on a one-price basis. The established rates are based on cost of hospital operation and cover professional services. Millionaire and day laborer presumably pay the same rate.

Report has it that under the direction of its first superintendent, who was well trained along the old lines of hospital management, the institution did not make expenses. The superintendent was dismissed and under the personal inspiration of Mr. Ford's private secretary, modern commercial methods were adopted. Publicity was given to the hospital's possession of a stethoscope, microtome, etc., and the staff of Johns Hopkins graduates only was advertised. Result—the hospital grew by leaps and bounds.

The reply of the surgeon-in-chief, Dr. Roy D. McClure, in a dignified way called attention to the phenomenal growth of the institution which, in his opinion, disproves the accusation of factory methods, and claimed the right to existence of a uniform fee scale.

The gist of the controversy is contained in two questions: first, the propriety of a hospital so closely connected with the professional staff, advertising to the public; second, shall there be a uniform or flexible fee scale?

Most hospitals advertise directly or indirectly and many a physician benefits thereby. It were better if all hospitals adhered to the same policies. When, however, as in the Ford hospital, the physician is paid by the hospital, advertising on the part of the hospital amounts to the same as professional advertising.

Mr. Ford's quixotic attack on the flexible fee

scale generally practiced by the profession is interesting. Only a man of wealth and strong conviction could so disturb the profession. Most hospitals have endowments and at that have difficulty in making expenses. It is not likely that any one hospital in a locality could adopt the Ford hospital system and survive. It would be a question of all or none. Such a system would doubtless be satisfactory to the profession from a financial standpoint, but would throw a greater patronage on free municipal institutions.

It is not generally realized how much medical attention is given voluntarily for little or no remuneration by hospitals and the medical profession. The relatively few large fees attract attention, only serve to commercialize medicine and often are unjustifiable. Sometimes they may act as a boomerang as in the case of Mr. Ford.

Fancy fees only serve to detract from the idea of service which we as a profession must firmly adhere to. The physician who renders service, as a rule, has no great difficulty in the way of financial compensation.

COMMUNICATIONS

435 Hamm Building
St. Paul, Minnesota
May 28, 1924

TO THE EDITOR:

I have just received a letter from Paris from my neurological confrère, Dr. Walton M. Kraus, of New York, but at present in France, calling my attention to Netter's and Urbain's recent work on the "Further Investigations of the Deviation of the Complement in Herpes Zoster."** These investigations indicate the identity of the causative agents of herpes zoster and chicken pox. Dr. Kraus states that from the clinical viewpoint it has been reviewed in America by McEwen (*Arch. Derm. & Syph.*, 1920); Kraus (*New York Medical Journal*, 1921); Riggs (*Minnesota Medicine*, 1922), and that these authors believe that these two diseases are due to the same or very closely related causes.

Netter and Urbain have demonstrated (*Comptes Rendus*, Jan. 26) an antigen obtainable from the sera and crusts of cases of herpes zoster (not labialis, which shows none of the reactions to be described), which fixes antibody of cases of herpes zoster. Further they demonstrated that this antigen has the same action upon blood serum from cases of chicken pox and that antigen obtained from chicken pox crusts also fixed both chicken pox and herpes zoster antibody. They confirmed this on thirteen additional cases of zoster. They conclude from this that the crusts or scabs

**Nouvelles Recherches sur la Deviation du Complement dans le Zona. Arnold Netter and Achille Urbain (*Comptes Rendus. Soc. de Biol.*, Vol. 90, No. 7, p. 461 (1924)).

of zoster contain an antigen capable of deviating the complement of the blood serum of both chicken pox and herpes zoster and that the converse obtains as well. Dr. Kraus believes that this bacteriological evidence added to the clinical evidence already accumulated emphasizes the probable identity of the causes of chicken pox and herpes zoster.

Very sincerely yours,

C. EUGENE RIGGS.

OBITUARY



DR. HALDOR SNEVE

Dr. Haldor Sneve, nationally known as a specialist in nervous and mental diseases and a resident of Saint Paul since 1899, died Sunday in San Diego, Calif., where he went a year ago in an effort to regain his health.

Dr. Sneve formerly was president of the Ramsey County Medical Society, the Minnesota Academy of Medicine and the Minnesota State Medical Association, and in addition to holding numerous other offices in medical organizations during his career, he was president of the Town and Country Club, Saint Paul, at the time he went to California. Golf was his hobby.

He is survived by his widow, who made the journey West a year ago and was with him at the time of death.

Dr. Sneve came to Saint Paul in 1899 from Minneapolis, to become chief surgeon of the Chicago Great Western Railroad, a post which he held for thirteen years. He was a lecturer on mechanotherapy at the University of Minnesota from 1896 to 1899 and clinical professor of mental and nervous diseases from 1911 to 1914.

He was born in Albert Lea, Minn., October 27, 1865, and

attended public school there. He was graduated from the Medical College of Ohio in 1887 and started his professional career as assistant surgeon in the National Military home at Dayton, Ohio, the same year.

From 1888 to 1890 Dr. Sneve was assistant superintendent of the Dayton, Ohio, hospital for the insane. He was the author of numerous medical papers and a member of many medical and scientific societies. He married Miss Katherine Stickney in 1897.

Dr. Sneve was a member of the Minnesota National guard for three years and served on the draft board during the World War.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

IMPRESSIONS OF THE CHICAGO SESSION

The seventy-fifth annual session of the American Medical Association which was held in Chicago, from June 9th to June 13th, was a memorable one from several points of view.

First, it was credited with the record attendance, the total registration being 7,819. The largest previous registration was 6,446 at the last meeting held in Chicago in 1908.

This session also marked an epoch in the history of the association, it being the twenty-fifth anniversary of the beginning of the organization of the medical profession through uniform county and state associations which in turn became the component parts of the great American Medical Association. Meanwhile the membership has grown until it has reached the grand total of over 90,000.

Through the genius, foresight and executive ability of Dr. George H. Simmons, this movement was started when he became editor and business manager of the Journal of the Association in 1899. The present form of organization was completed and put into operation at the St. Paul session in 1901.

And now that Dr. Simmons has lived to witness the full fruition of his plans, with the establishment of the association in its own home at 535 North Dearborn St., it was indeed a fitting tribute that on his retirement from the heavy burden of his position he was tendered a testimonial dinner at the Congress Hotel on the evening of June 9th, at which in the presence of more than 400 fellows he was presented with a life-sized portrait which will ultimately be placed in the building of the association.

This meeting was presided over by Dr. Harvey Cushing, of Boston, and addresses were made by Drs. Cushing, Frank Billings, W. J. Mayo and Mr. Will Owen Jones, editor of the Nebraska State Journal. The portrait of Dr. Simmons was presented by Dr. William S. Thayer, of Baltimore, to which Dr. Simmons responded briefly but appropriately.

The meeting place in the new municipal pier, on the lake front, was an innovation and was, in most respects, a successful experiment. The ample space available made it possible to house everything under one roof. This furnished ample space for registration, for the commercial and scientific exhibits, and also made possible the housing of the various sections of the scientific assembly close together so

that one could readily go from one section meeting to another without loss of time.

There were two serious drawbacks, however, to this arrangement. The temporary division of the space in the great pier to accommodate the various sections left much to be desired in acoustics, and the very general custom nowadays of those presenting papers to demand facilities for lantern demonstrations, if only for the exhibition of a few tables of figures, made it necessary to board the room on all sides, rendering it dark, barn-like and unattractive in appearance, and impossible of ventilation. For this last inconvenience, fortunately, the weather was cool. These disadvantages, however, were of minor importance as compared with the many advantages.

The scientific exhibit was perhaps the best and largest ever shown and there were 140 individuals who participated. An interesting feature, and one that was most popular with the visiting doctors, was the daily demonstration of fresh pathological material received from the Chicago hospitals and the Bureau of Animal Industry at the stockyards.

The opening of the general meeting was held Tuesday evening, June 10, at the Auditorium Theater, at which time President-elect Dr. William A. Pusey read his presidential address, which appeared in the *Journal* June 14th.

The officers elected for the ensuing year were as follows: President, Dr. William D. Haggard, of Nashville, Tenn.; Vice-President, Dr. E. B. McDaniel, of Portland, Oregon; Secretary, Dr. Olin West; Treasurer, Dr. Austin A. Hayden, of Chicago; Speaker of the House of Delegates, Dr. Frederick C. Warnshuis, of Grand Rapids, Mich.; Vice Speaker, Dr. Rock Slyster, of Wisconsin.

Two members of the Board of Trustees, Dr. Wendell C. Phillips and Dr. Frank Billings, declined to be candidates for re-election and the vacancies created by their retirement were filled by the election of Dr. J. H. Walsh, of Illinois, and Dr. Edward B. Heckel, of Pennsylvania.

Dr. Thomas McDavitt, whose term of office also expired, was unanimously re-elected.

With the retirement of Dr. George H. Simmons from active participation as editor of the *Journal* and general manager, there will be little change, as Dr. Fishbein, who succeeds him as editor of the *Journal*, has been in training for the position for some time. The same may be said of Dr. Austin A. Hayden, who is to become business manager. It is a source of satisfaction to know that the valuable services of Dr. Simmons will still be at the disposal of the association in an advisory capacity.

The meetings of the House of Delegates and of the various committees were held in the Association Building at 535 North Dearborn Ave., 132 delegates out of a total of 150 being registered. In the prompt transaction of business the house made a record and this was largely due to the ability of its speaker, Dr. Frederick Warnshuis, and the indefatigable efforts of our very able and efficient secretary, Dr. Olin West. Familiarity of the delegates with the business to come before the house also facilitated greatly the transaction of business.

State associations are coming to realize more and more the necessity of exercising great care in the selection of the delegates to represent them, and it is a common custom to return a delegate who has rendered conspicuous ser-

vice, for a second or even a third term. It is a matter of record that it requires one term for the new member to become acquainted with the business before the house and to get his bearings. For the first year he is assigned no committee appointment, and perhaps only a minor one the second year, and it is the members of committees who do the work. Therefore, the new member has little more than the privilege of a seat and vote. Our policy of promoting alternates to succeed to delegates does not meet the requirements, as the alternate does not attend the meetings, except in the absence of the regularly elected delegate. It is a great honor to be selected to represent the association in the House of Delegates, second only to the presidency of the association, but instead of passing the honor along to members of our association whom we wish to recognize, would it not be well to look particularly to his qualification, his interest in the association, his familiarity with the working of the organization, and then if he makes good to continue him in office for at least a second term?

According to the recommendation of the House of Delegates, if the Board of Trustees adopts the reapportionment plan, Minnesota will have three members in the next House of Delegates.

Invitations from three cities were reported by the Board of Trustees for the next session, Atlanta, Georgia, Atlantic City and St. Paul, Minnesota. A majority of the House of Delegates expressed a preference for Atlantic City. Final choice of time and place of meeting will be decided upon by the Board of Trustees.

LYMANHURST AND PARKVIEW STAFF MEETING

The regular monthly meeting of the Lymanhurst and Parkview medical staffs will be held at the Lymanhurst School, 1800 Chicago Avenue, Minneapolis, Tuesday evening, July 22, at 7:00 o'clock.

The following program will be given:

"X-ray Findings and Significance of Different Types of Tuberculosis in Chests of Children." Dr. Russell Gates.

"Roentgenologic Distinction Between Tuberculous and Non-Tuberculous Diseases of the Lungs." Dr. F. S. Bissell.

"Roentgenologic Diagnosis of Gastro-Intestinal Tuberculosis." Dr. R. G. Allison.

"Roentgen Therapy in Tuberculosis." Dr. Leo Rigler.

All persons interested in tuberculosis are invited to attend these meetings and participate in the discussions.

CONFERENCE OF STATE AND PROVINCIAL HEALTH AUTHORITIES OF NORTH AMERICA

At the thirty-ninth annual meeting of the Conference of State and Provincial Health Authorities held in Lansing, Michigan, June 16 and 17, 1924, Dr. James A. Hayne, State Health Officer of South Carolina, was elected president; Dr. B. U. Richards, State Health Officer of Rhode Island, vice-president, and Dr. R. M. Olin, State Health Officer of Michigan, re-elected secretary-treasurer.

The attendance at the conference included thirty-one state health officers, one provincial (Saskatchewan) representative and a large number of guests. Following the conference proper, members and guests were given the opportunity of studying the methods of the Michigan Health Department which is housed in the State Office Building.

"The Automobile as a Public Health Hazard" was the subject of the president's address delivered at the opening session by Dr. A. J. Chesley, St. Paul.

STEARNS-BENTON MEDICAL SOCIETY

The Stearns-Benton Medical Society held its annual meeting at St. Raphael's Hospital, St. Cloud, on April 17. Officers elected for the coming year are: President, Dr. C. B. Lewis, St. Cloud; vice-president, Dr. G. S. Sutton, St. Cloud; secretary-treasurer, Dr. J. N. Libert, St. Cloud.

OF GENERAL INTEREST

Dr. E. R. Crow, formerly of Green Isle, is now located in Minneapolis.

Dr. Ernest H. Morris, formerly of Austin, is now located in Canadian, Texas.

Dr. George A. Geist, of St. Paul, has announced the removal of his offices from West Seventh Street to 741 Lowry Building.

Dr. E. M. Hammes, St. Paul, has moved into new offices at 535 Lowry Building. Dr. Gordon B. Kamman is associated with Dr. Hammes.

Dr. W. H. Hengstler, who recently returned from California, is now associated in practice with Dr. C. E. Riggs in the Hamm Building, St. Paul.

Dr. Everett Charles Hartley has announced the opening of offices in the Lowry Building, Saint Paul, for the practice of obstetrics and gynecology.

Dr. W. P. Shepard, assistant director of the Students Health Service at the University of Minnesota, has been granted a year's leave of absence.

Dr. R. H. Kennicott is now associated with Drs. Frick and Smith, Los Angeles, California. They have recently moved into the new medical office building.

Announcement has been received of the marriage of Dr. Erling W. Hansen, of Minneapolis, to Miss Anna Ruth Eddy, Minneapolis, which took place June 4.

Dr. Louis A. Hauser, formerly of St. Paul, has entered private practice in New York City. He has also a teaching position on the Cornell University teaching staff.

Dr. Kenneth Phelps, Minneapolis, has received notification of his election to membership in the American Bronchoscopic Society, an organization of forty members.

Dr. L. W. Morsman, Hibbing, sailed for Europe on the steamship Volendam from New York, June 14. Dr. Morsman will spend a year doing post-graduate work in Vienna.

Appointment of Dr. Charles E. Proshek to the fellowship in obstetrics and gynecology maintained by the Swedish Hospital has been announced by the School of Medicine, University of Minnesota.

Dr. Andrew Sinamark, formerly of the Gifford Clinic, Omaha, is now associated with Dr. L. W. Morsman, of Hibbing, Minn. Dr. Sinamark limits his practice to diseases of the eye, ear, nose and throat.

Dr. Charles A. Reed, of Minneapolis, was a guest of the surgeons of the Great Northern railroad at their annual

meeting in Spokane, Washington, June 23 and 24, where he read a paper on "Back Injuries."

The new deep x-ray therapy equipment which Dr. Edward Schons has been installing at St. Luke's Hospital, Saint Paul, is now in operation. The apparatus includes one of the first thirty-milliampere high voltage, water cooled Coolidge tubes to be installed for clinical use.

Dr. and Mrs. John F. Fulton, Saint Paul, sailed last month for England, where they are the guests of their son and daughter-in-law, Mr. and Mrs. John F. Fulton, Jr., who make their home in Oxford. Dr. Fulton will return to Saint Paul the middle of this month. Mrs. Fulton expects to spend the entire summer abroad.

Physicians from thirty-six communities were registered at the Medical Short Course at the University of Minnesota, which was recently brought to a close. Fifteen were from Minnesota, seven from Iowa, six from North Dakota, and one from Wisconsin. A second medical short course of two weeks will be conducted in September according to an announcement made by R. R. Price, director of the General Extension Division.

Public Health Summer Schools are being conducted this year for the first time by the Universities of Columbia, Michigan, Iowa and California. These courses are suggested by the United States Public Health Service and offer an opportunity to those engaged in the various branches of public health work to obtain instruction in a great variety of subjects. The National Health Council has called the attention of the profession to this new departure in University summer courses.

The New Prague Community Hospital was opened to receive patients, June 9, 1924. The hospital is to be operated by a voluntary association without capital stock, and it is provided that no profit or dividend shall ever be paid to any member or individual. It is organized and will be operated solely to provide a service to the community. The operating room is thoroughly equipped and a high grade sterilizer has been installed. There is a fully equipped separate maternity department with delivery room and excellent accommodation for patients.

The distinction of having the highest rank of any student in the past seven years belongs to Miss Huldah Thelander, of Little Falls, who was a member of the graduating class of June, 1924, at the University of Minnesota Medical School.

The leading graduate student to receive the M.D. degree is Dr. Frederick C. Eberson, who has won distinction as a graduate student of bacteriology. Dr. Eberson, who came to Minnesota two years ago, has been working under fellowships granted by the Hennepin County Medical Society.

Enlargement by approximately 100 beds of the Minnesota General Hospital, situated at the University of Minnesota, was begun June 18 when steam shovels began excavating for the Todd Memorial and George Chase Christian Memorial units on the university campus. The Todd hospital will be built especially for the treatment of eye, ear, nose, and throat cases. The Christian Memorial unit will be a cancer hospital.

Dr. L. B. Baldwin, superintendent of the University hos-

pitals, expects to have the new buildings ready for use a year from September.

A gift of \$250,000 by the Citizens Aid Society of Minneapolis has made possible the erection of the cancer hospital. The Citizens Aid Society is a foundation established by the late George Chase Christian. Of the total, \$200,000 will go into the building and \$50,000 into special radium and X-ray equipment for treatment of cancer.

Gifts of \$20,000 by Mrs. Frank C. Todd, widow of the physician after whom it is named, \$20,000 by Mrs. E. C. Gale and \$5,000 by Mrs. Mapes gave the nucleus of the Todd hospital fund. The regents have added from building funds money to erect a hospital costing, with equipment, about \$180,000.

The capacity of the University hospitals is increased from 193 beds to approximately 300 beds by the additions.

By an act of the 1921 legislature the University hospitals are also the Minnesota general hospital, to which any county may send patients for care. In these cases half of the expense is borne by the state and half by the county.

Both hospitals will be built along Union Street Southeast and will be connected by a wing with the Elliott Memorial hospital, which stands on the river bank, overlooking East River Drive.

Approximately 95 physicians have been added to the rolls of medical practitioners in Minnesota by the University of Minnesota Medical School during the past year according to statistics in the office of Dean E. P. Lyon. Forty were graduated with the M.D. degree at the end of the fall quarter last December, two were added in April, and 53 more doctors were graduated June 18 at the close of the college year.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

ABBOTT LABORATORIES:

Neutral Acriflavine-Abbott for Intravenous Injection,
0.1 gm. (ampules)

HOFFMANN-LA ROCHE CHEMICAL WORKS:

Digalen-Roche (Cloetta)
Ampules Digalen-Roche (Cloetta), 1.1 c.c.
Tablets Digalen-Roche (Cloetta)
Hypodermic Tablets Digalen-Roche (Cloetta)

LEDERLE ANTITOXIN LABORATORIES:

Pollen Antigens-Lederle
Giant Ragweed Pollen Antigen-Lederle; Green Sage Pollen Antigen-Lederle; Lamb's-Quarters Pollen Antigen-Lederle; Marsh Elder Pollen Antigen-Lederle; Olive Pollen Antigen-Lederle; Pasture Sage Pollen Antigen-Lederle; Southwestern Ragweed Pollen Antigen-Lederle; Western Water Hemp Pollen Antigen-Lederle; Western Ragweed Pollen Antigen-Lederle

MEAD, JOHNSON & Co.:

Mead's Powdered Protein Milk

OHIO CHEMICAL AND MFG. Co.:

Ethylene for Anesthesia

E. R. SQUIER AND SONS:

Pollen Allergen Solutions-Squibb

Annual Salt Bush Pollen Allergen Solution-Squibb; Arizona Ash Pollen Allergen Solution-Squibb; Arizona Cottonwood Pollen Allergen Solution-Squibb; Arizona Walnut Pollen Allergen Solution-Squibb; Ash Pollen Allergen Solution-Squibb; Black Mulberry Pollen Allergen Solution-Squibb; Bermuda Grass Pollen Allergen Solution-Squibb; Black Walnut Pollen Allergen Solution-Squibb; Brome Grass Pollen Allergen Solution-Squibb; California Black Walnut Pollen Allergen Solution-Squibb; Careless Weed Pollen Allergen Solution-Squibb; Cedar Pollen Allergen Solution-Squibb; Cocklebur Pollen Allergen Solution-Squibb; Corn Pollen Allergen Solution-Squibb; Dark Leaved Mugwort Pollen Allergen Solution-Squibb; False Ragweed Pollen Allergen Solution-Squibb; Hickory Pollen Allergen Solution-Squibb; Johnson Grass Pollen Allergen Solution-Squibb; June Grass Pollen Allergen Solution-Squibb; Lamb's-Quarters Pollen Allergen Solution-Squibb; Marsh Elder Pollen Allergen Solution-Squibb; Nettle Pollen Allergen Solution-Squibb; Oak Pollen Allergen Solution-Squibb; Mugwort Pollen Allergen Solution-Squibb; Orchard Grass Pollen Allergen Solution-Squibb; Pigweed Pollen Allergen Solution-Squibb; Pine Pollen Allergen Solution-Squibb; Poplar Pollen Allergen Solution-Squibb; Ragweed Pollen Allergen Solution-Squibb; Rye Pollen Allergen Solution-Squibb; Sagebrush Pollen Allergen Solution-Squibb; Sandbur Pollen Allergen Solution-Squibb; Shadscale Pollen Allergen Solution-Squibb; Sheep Sorrel Pollen Allergen Solution-Squibb; Slender Ragweed Pollen Allergen Solution-Squibb; Sweet Vernal Grass Pollen Allergen Solution-Squibb; Timothy Pollen Allergen Solution-Squibb; Western Ragweed Pollen Allergen Solution-Squibb.

WILSON LABORATORIES:

Desiccated Parathyroid Substance-Wilson

Tablets Desiccated Parathyroid Substance-Wilson,
1/20 grain
Tablets Desiccated Parathyroid Substance-Wilson,
1/10 grain

NEW AND NON-OFFICIAL REMEDIES

Cryogenine Phenylsemicarbazide.—Cryogenine is an antipyretic and analgesic. It is claimed that cryogenine does not affect digestion and that it has scarcely any effect on the circulation and respiration. Cryogenine is claimed to be useful as an antipyretic in febrile conditions. As an analgesic, it is said to be of value in rheumatism, headache, sciatica, gout and in painful conditions generally. Cryogenine is marketed in the form of powder and 0.5 gm. tablets.

Neosphenamine (Mallinckrodt).—A brand of neosphenamine. N. N. R. For a discussion of the actions, uses and dosage of neosphenamine, see New and Non-official Remedies, 1924, p. 49. Neosphenamine-Mallinckrodt is marketed in ampules containing, respectively, 0.15, 0.3, 0.45, 0.6, 0.75, 0.9 and 1.5 gm.

letin (Insulin-Lilly) U-10.—Each ampule contains 40

units of Iletin (Insulin-Lilly) (see New and Non-official Remedies, 1924, p. 152). (Jour. A. M. A., May 3, 1924, p. 1443.)

Ethylene for Anesthesia.—*Aethylenum pro Narcosi.*—It contains not less than 93 per cent by volume of ethylene. Trials on human subjects have confirmed the anesthetic and analgesic value of ethylene as demonstrated on animals. Deep surgical anesthesia is stated to be produced easily and analgesia comes on readily and apparently long before surgical anesthesia is established. Given with oxygen, it has been found more powerful than nitrous oxide for animals and man, and in most cases as effective as ether. Trials indicate that ethylene is of value for the production of surgical anesthesia, and that it has advantages over nitrous oxide. Ethylene for anesthesia is supplied in the compressed state in metal cylinders. To avoid accidental explosion, ethylene must not be brought in contact with a naked flame or an electric spark. Ohio Chemical and Mfg. Co., Cleveland. (Jour. A. M. A., May 17, 1924, p. 1600.)

Desiccated Parathyroid Substance.—*Wilson.*—The exterior parathyroids of the ox, freed from fat, cleaned, dried and powdered. For a discussion of the actions and uses of parathyroid gland, see New and Non-official Remedies, 1924, p. 224. Desiccated parathyroid substance—Wilson is marketed in the form of powder and in tablets containing, respectively, 1/20 grain and 1/10 grain. Wilson Laboratories, Chicago. (Jour. A. M. A., May 24, 1924, p. 1693.)

Mead's Powdered Protein Milk.—A milk preparation having a relatively high protein content and a relatively low carbohydrate content. Each 100 gm. contain approximately protein 37 gm., butterfat 31 gm., free lactic acid 3 gm., lactose 19 gm., and ash 4.6 gm. When suitably mixed with water, powdered protein milk is said to be useful for correcting intestinal disorders of infants and children. Mead, Johnson & Co., Evansville, Ind.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

MEETING OF MAY 14, 1924

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, May 14, 1924, at 8 p. m. The meeting was called to order by the President, Dr. Hamilton. There were thirty-four members and three visitors present.

The minutes of the April meeting were read and approved.

The following case reports were given:

1. DR. A. C. STRACHAUER (Minneapolis) reported three cases of carcinoma of the rectum, with demonstration of specimens. He then presented the subject of surgery of cancer of the rectum, and showed lantern slides.

In briefly reviewing our experience in this field the following features stand out prominently:

1. The long interval of time elapsing between the appearance of the symptoms of cancer of the rectum and the time of institution of treatment. The majority of patients have not heeded or appreciated the importance of Nature's warning.

2. The long interval that so commonly obtains between

the time of the first visit of the patient to a physician on account of warning symptoms and the institution of proper treatment. Here the profession is grossly derelict. In many instances not even a digital examination is made. One of the cases here presented was treated for diarrhea, secondary to a carcinoma of the rectum that could be readily palpated, for over a year without a digital examination ever being made.

3. As a profession, we are making the mistake of regarding only patients over thirty-five or forty years as being in the cancer age. We have had a number of cases of cancer of the rectum under thirty, the youngest being twenty-six.

4. Surgery of carcinoma of the rectum has been a dark chapter attended by high mortality and morbidity and unsatisfactory after-results. The Kraske operation, with removal of the lower sacral segments, is a formidable and mutilating procedure. Bilroth, in 1896, reported 608 cases with a mortality of 53 per cent. The institution of the two-stage operation cut this mortality in about one-half. The two or more stage operation with improvement in technical details has further reduced the mortality to less than two per cent.

The posteriorly placed artificial anus is purely a matter of sentiment, and when so placed without sphincter control it is the poorest of locations. A lower left rectus anus performed with an ample loop of bowel for the accumulation of feces, with a valve opening, is nearly as satisfactory as the normal. I have one such patient of eleven years' standing who states that he has gotten along nearly "as good as before." The exercise of the voluntary control of the lower rectus muscle can be further developed and is at times of assistance to these individuals. A truss with pad over the artificial anus has been found to be more satisfactory than a colostomy bag.

Hemorrhage and infection have been the outstanding responsible factors in making cancer of the rectum so dark a chapter in the practice of surgery. Hemorrhage and shock are synonymous. Patients who have lost blood are more susceptible to the ravages of sepsis and respiratory infection and the various postoperative complications.

Dr. Coffey has developed what constitutes the nearly ideal operation in that it controls these two factors and in addition provides for the performance of the major procedure by the abdominal route, all performed under the direct vision of the operator.

An ample right rectus incision is made with the patient in the extreme Trendelenburg position.

a. The superior hemorrhoidal artery is ligated and divided just below the promontory of the sacrum, thus controlling the arterial hemorrhage of the operative field at its source instead of repeatedly dividing the terminal branches with successive hemorrhages as in the Kraske operation.

b. The major dissection is performed through the abdomen under direct vision of the operator, with complete hemostasis by ligature and suture. The bowel is separated from the uterus in the female and the bladder in the male, and the dissection carried down below the tip of the coccyx, if indicated. Opportunity for the removal of lymph nodes and perirectal fat and tissues is afforded under direct vision. The bowel is divided by the cautery, thus sterilizing the cut surfaces of the bowel. A left rectus anus with a trap

is formed and the lower portion of the sigmoid and rectum are invaginated through the anus by traction on a rectal tube fastened to the divided end of the bowel. The peritoneal floor of the pelvis is completely closed over this dissection and by drawing in the loose peritoneum from the sides of the pelvis an extra-peritoneal cavity drainage tract (the latter formed of peritoneum) is established, draining suprapubically from the region of the base of the bladder. In the female, after closure of the peritoneum of the floor of the pelvis, a post-vaginal drainage is established.

The second stage of the operation is performed after ten days, and is a quite minor and bloodless procedure, ten or twelve minutes sufficing for its performance. In the female it is not even necessary to remove the coccyx. In the male an incision is made around the anus and extended over the length of the coccyx, the latter being removed, and the rectum and invaginated sigmoid scooped out. By placing a rubber tube down the suprapubic tract on through the operative field, with its exit through the perineum, the entire operative field in the hollow of the sacrum can be washed, kept clean, and irrigated with Carrel-Dakin fluid, thus controlling the element of sepsis, hastening healing and greatly shortening the postoperative convalescence.

2. DR. A. W. COLLINS (Duluth) gave the following case report:

C. G. D., age 34, married. Born in Maine. Occupation—executive secretary. Mother died at about the age of 70, cause unknown. Father living and in fair health, age 70 or over. No family history of tuberculosis, carcinoma, insanity or Bright's disease. Patient was a healthy child until in his teens or about twenty years ago, when he was operated upon for appendicitis, at which time the wound drained for three weeks, which he spent in bed. About one week ago, while skiing down a hill, he struck against a stone fence and hurt his right side in the neighborhood of the old operation scar and had pain along the groin and down into the right cord and testicle. Two days before I saw him, in January, about one week following the skiing accident, he made a long auto trip into the country on business and became quite chilled. He complained of much pain in the right side on that day. On Sunday, the following day, January 20, 1924, he was worse and stayed in bed. On Monday, January 21st, I saw him at the instigation of Dr. Cyril Smith. I found him lying in bed in no characteristic attitude of pain; he complained of tenderness in the right abdomen and gave me the above history, also that he had had a chill on the evening of January 19th and that he had had more or less distress in urinating.

Examination: No lung involvement. His temperature on admission to the hospital was 102, and the tenderness was exquisite over the old wound, but there was no sign of fluctuation; he was also tender out in the right lumbar region. Pressure from the back forward in this region made him wince considerably. The tenderness in the right iliac region extended upward and gave considerable spasm to the muscles in the liver region. The left rectus (muscle) was not spastic. There was no resistance in the other portions of the abdomen. On careful questioning he stated that the appendix was removed at the time of his operation twenty years ago. He insisted that the operation was done by a competent surgeon in a large city, who was chief of a

surgical service, and that the appendix was removed, according to the statement of the surgeon.

The urine was scanty, very dark in color and contained no sediment. The tongue was thickly coated. The bowels had moved the day before, he having had a physic. The stereo-x-ray of the chest was negative. The throat was negative. On further examination of the abdomen a quick pressure over the sigmoid gave reflex pain in the region of the cecum. The white count was 19,000.

Diagnosis at that time: acute pelvic infection, possibly intestinal obstruction from old adhesions, possibly abscess in the pelvis.

Operation: Separation of intestinal adhesions and severing of constricting bands.

Operation findings: The cecum was bound down in the lumbar trough and adherent beneath the old appendectomy scar. It was folded on itself with adhesions, the last three or four inches of the ileum were pulled down into the pelvis by adhesive bands. The last two or three inches of ileum were constricted by bands. The gut was red, and, in spots, raw. The omentum at one spot adherent, red and thickened. No pus. No appendix. Adhesions separated and the constricted gut freed by cutting the bands.

Anesthetic: ether. Drainage by rubber tube.

Peritonitis developed rapidly and he died the following evening.

Autopsy showed: Spleen, adrenals, bladder, prostate, liver, stomach, small intestines, lungs, all practically negative. The external iliac glands of the right side very much enlarged, congested and edematous. Marked proliferation of the connective tissue below the old lateral appendectomy scar described above. This fibrous tissue in places very congested and edematous and shows slits filled with pus. Such spaces filled with pus are found between the fascia transversalis and the transversus abdominus, near to the iliac crest, and also between the anterior layer of the lumbodorsal fascia and the quadratus lumborum, near to the iliac crest.

The soft parts are very much congested, edematous and infiltrated around the right iliac crest, around its anterior part. The iliac crests are then cleaned of the surrounding soft parts and the anterior part of the right iliac crest is seen to be about one and one-half times as thick as the left one. On cut surface, the corticalis of the right iliac crest is thick, and very dense; the spongiosa is also more dense than usual. The peritoneum at the surface of this thickened bone is also more thick and tough than on the left side. No abscess is found in the bone, no sequestrum. The only observation made is the thickening of the bone, the thickening of the periosteum, the edema and fibrosis of the surrounding tissues which are in direct connection with the above described purulent fistulous tracts. No changes can be found in the other parts of the iliac bone, in the 12th rib, or in the dorsal column.

The diameter of the thigh is the same on both sides. There are no apparent wounds of the right limb, or of the anus.

The cecum was attached to the iliac fossa somewhat tighter than usual, by tough connective tissue. (The appendix had been removed about twenty years ago and no rests in the wound of amputation could be found on the cecum.)

The periosteum of the iliac bone is not loosened at any place; there are no naked and rough bony surfaces.

No perforation of the gut at any point, the gut having been filled with water to determine this.

Anatomical Diagnosis:

Status after recent laparotomy.

Status after old appendectomy.

Retrocecal chronic inflammation.

(Reactive) periostitis of the right iliac crest.

Inflammation of the peritoneum. (Peritonitis.)

Cloudy swelling of the kidneys.

Cloudy swelling of the liver.

Chronic cholecystitis.

Smears of pus of the parietal abscesses show numerous isolated gram-positive cocci and only a few short chains of streptococci, several groups of staphylococci.

Summary: This seems to me an unusual condition of infection lurking in an old drainage wound following appendectomy, 20 years ago. The lighting up probably had its origin in the "bump" against the stone fence a week before admission to the hospital and his lack of care of himself in the interim.

The obscurity was deepened by his insistence that the appendix was removed. The doubt of this still lurked, however, in the minds of consultants and myself.

3. DR. A. E. BENJAMIN (Minneapolis) reported a case of acute appendicitis, rupture, gangrenous, and intussusception.

Mrs. W., 41, married, 2 children (20 and 10). Family history negative.

Personal history: Well, except following birth of first child had pelvic peritonitis with some pelvic trouble for some time, with pain on the left side of the lower abdomen.

Symptoms: Was taken suddenly ill on the morning of the 13th, with acute gastric disturbance and soreness in the right lower quadrant. Has had paroxysmal attacks of pain with relief between. Was sent to the hospital on the evening of the 13th. Leucocyte count 16,000; temperature 99, which rose to 100 the next morning. Urinalysis: slight trace of albumen, otherwise negative.

Morning of the 14th, patient feeling very well. Temperature 100 and pulse 100. Great deal of pain upon pressure over the appendix. No vomiting. Abdomen fairly flat.

Operation: Under local anesthetic, gas and ether, median incision was made. The left ovary was found three times normal size, fibro-cystic, with left tube enveloping it and two parovarian cysts, thin-walled and containing about an ounce of serum. The outer half of the tube and the ovary were removed, also the cysts. The gallbladder was large, but contained no stones. It was somewhat prolapsed.

The appendix was acutely inflamed and two and one-quarter inches long, not diseased at the outer half. The base of it being surrounded by inflammatory bands and the cecum creeping upon the lower third of the appendix, the base being inverted somewhat. The cecum around the base of the appendix was very much thickened and inflamed. The ileum was kinked somewhat. This whole mass was telescoped into the ascending colon, which was redundant, showing a definite beginning of intussusception. A few bands were beginning to form, holding it in this position. This was reduced as well as the base of the

appendix, gently pulling out all the surrounding cecum. The appendix had ruptured at the base, but the imbedded condition prevented the pus escaping before operation. The base was entirely gangrenous as well as a part of the cecum. The appendix was removed and this portion of the cecum involved. Supplementary sutures brought the other portion of the cecum, mesentery, appendix and omentum over the involved diseased area. A Penrose drain was left to drain this diseased area.

Patient operated upon this morning, May 14, 1924.

4. DR. A. SCHWYZER (St. Paul) gave an additional report of a case:

This case was presented before the Academy two and one-half years previously. Patient, a lady, then 69½ years old, was operated on two and one-half years ago. Cholecystectomy was done for severe cholecystitis with stones; and because there was great thickening in the cystic duct we inadvertently removed the whole of the hepatic duct. This case was then published last fall in the "Surgical Clinics of North America." We were not sure at the time of operation that we had injured the duct, but thought we had, because there was a suspicious looking cord running upward. While the assistant closed up the wound I went into the laboratory and cut the specimen open. In the wall of the cystic duct we noticed a little tube. A frozen microscopic section showed epithelium. The shape of the tube showed that the upper end was near the bifurcation. We had not only removed part of the hepatic duct, but had removed every bit of it. The wound was amply drained. I went in again after six days, which I thought would be just long enough to have the effect of the operation overcome and short enough so that I could still open the wound easily. We found back of the duodenum and covered by fibrin, the tied-off common duct. On the liver there was the raw surface from the cholecystectomy and no sign of the duct. However, we found a little catgut on a small cord and hoped that was where we tied the duct. We loosened that ligature and it started to pump; it was the cystic artery. No place could be made out on the surface of the liver where the duct should be. But mopping carefully we finally saw a little oozing of bile, so we took a large uterine sound and went in. It slipped in easily toward the left, so that we knew we were in the left hepatic duct. Some bile escaped along this sound. We introduced a small catheter cut on a slant and left it there. The stump of this cystic artery was used to anchor it with chromic catgut. The lower part of the tube was also cut on a slant so as not to cause any pressure. The catheter was left long, so as to get the lower end out of and beyond the duodenum. After dilating the papilla, the tube went in easily. We could readily approximate the upper end of the common duct to the liver, but there was nothing to hold it except that cystic artery stump.

The tube was left in till now. It was thus in for two and one-half years, and the patient came to town at different intervals. Each time the x-ray picture was identical, with the tube remaining in place. She was perfectly well. I had word from her two years after the operation that she did her work and was well.

All went well until about three weeks ago, when she developed chills, temperature 103 degrees to 103½, and

she became severely jaundiced. She was brought to the city. We put her on Carlsbad, hoping for a gradual decrease of the fever. At the end of 8 days the same condition existed. From the x-ray picture it appeared that the tube was still in place. We had to remove that tube. But, perhaps, had the tube come out of the duct and was the present condition due to a stricture? When the tube was removed by nicking the duodenum and grasping the tube with a thin artery forceps, it retained the shape it shows in the x-ray picture, and was quite stiff. You see here the tube. I throw it on the table and it retains the same curves which you saw in the x-ray two and one-half years ago and which you see in the one taken immediately before this last operation. That is undoubtedly the reason why it was not passed.

In the upper opening of the tube we noticed a smeary greyish-looking material. We figured if this was pus, the tube had remained in place, as otherwise food would have washed it clean of pus. If the tube had been in place, our operation promised a good result. We thus made a smear of this material and found it to be pus with an immense amount of bacilli of hay-bacillus shape.

The patient thus had an infectious cholangitis. The chills stopped and now, after eight days, she is free from fever, sits up, and the jaundice has already nearly disappeared.

Dr. Schwyzer also showed autopsy specimen of a case of aneurysm of the uppermost part of the descending aorta, perforating in three places into the left bronchus. Case died very suddenly from hemorrhage. The posterior wall of the aneurysm had disappeared from pressure against the vertebral column. Three vertebræ had been eroded with the intervertebral cartilaginous discs protruding, as they are less readily yielding to pressure.

DR. S. E. SWEITZER (Minneapolis) then gave his inaugural thesis, entitled "Protean Skin Diseases, Including Syphilis; Lantern Slide Demonstration."

DISCUSSION

DR. C. D. FREEMAN (St. Paul): The method by which Dr. Sweitzer has made his entré into the Academy of Medicine is very commendable. When I heard he was to give a lantern slide demonstration instead of a thesis on some rare skin disease, I told him he used good judgment. To the average physician dermatology is a vague subject and an ultra-scientific paper by him before a body of general men would be similar to a surgeon, neurologist, or oculist delving into the intricacies of their specialty before a dermatological society.

He has practically made a clinical evening of it and has shown slides of cases many of you can recognize. I think Dr. Sweitzer is to be congratulated on his collection.

DR. PAUL COOK (St. Paul): I only wish to add that the change in the last twenty years has been very marked in the teaching of dermatological subjects. With the development of photography and showing of lantern slides, I think all physicians will be better trained in dermatology. Heretofore the ordinary courses in dermatology have consisted of lectures. The only way one can teach dermatology is to show patients with the disease or show lantern slides that will picture it clearly. I think in a few years opticians will develop lenses so that they will show the lesions better,

and there are great possibilities in color photography. Heretofore one had to go into the clinic and spend an immense amount of time examining patients.

The meeting adjourned.

JOHN E. HYNES, M.D.,
Secretary.

PROGRESS

Abstracts to be submitted to Section Supervisors.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH
THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

DISTURBANCES OF RENAL FUNCTION IN PERNICIOUS ANEMIA: Edward J. Stieclitz (Arch. of Int. Med. for Jan. 15, 1924) points out that in pernicious anemia there is frequently evidence of mild renal damage, manifesting itself by albumin, casts, or both, in the urine. He brings out the fact that up to the present time it has been assumed that this renal irritation or damage is the result of malnutrition and anoxemia of the kidneys, due to the anemia. However, this is by no means as pronounced in cases of secondary anemia. While admitting that the hemolytic intoxication of pernicious anemia may injure the kidneys directly, he brings out the fact that the deposition of iron in the kidneys may cause mild nephritic changes in experimental animals, and that therefore renal hemosiderosis might be responsible for the renal disturbances in pernicious anemia.

With regard to the incidence of renal disturbance, Cabot has reported an incidence of 46 per cent albuminuria in 506 cases of pernicious anemia, whereas at Johns Hopkins, in 50 cases, the incidence was 62 per cent. On the other hand, in 100 cases of secondary anemia, associated with a great variety of diseases, from the Presbyterian Hospital, Chicago, albuminuria was present in only 14 per cent. This shows a very striking difference in the occurrence of albuminuria in the two types of anemia.

The relationship between the hemoglobin content of the blood and the presence or absence of renal changes is interesting. Out of 150 cases of pernicious anemia, the average hemoglobin content was 41 per cent; the average of the albuminuric cases was 36 per cent, and for those without albumin 46 per cent.

The observations of many men as to the clinical character of the renal disturbance show that there is rather fixed low urinary specific gravity in connection with this disease, and that this is more pronounced with the decrease in the hemoglobin content of the blood. The PSP test usually shows a good output; blood chemistry usually normal, except for a slight increase in the uric acid content.

In regard to the pathologic changes, he states that these have not been as clear as the clinical changes. The study of the kidneys at necropsy has not yielded evidence of

uniform pathologic changes. However, from the protocols from the pathologic laboratory of Johns-Hopkins hospital of necropsies of 36 cases of pernicious anemia, 83 per cent of these showed renal pathologic changes. The most common and uniform finding was tubular degeneration, which occurred in 53 per cent of the cases. In 42 per cent there was a gross renal hemosiderosis. Where special study was made, microscopic hemosiderosis was found in 14 out of 15 cases.

His conclusions are that the most characteristic change in the kidney of pernicious anemia is perenchymatous tubular degeneration, whereas the second, and probably the more important, finding is the renal hemosiderosis.

Experimental studies by several men have demonstrated the fact that the iron content of various organs was definitely increased in pernicious anemia. This relative increase is most marked in the kidneys, but also very evident in the liver and spleen. It has been shown that the deposition of iron in the kidneys is practically constant in its distribution, and exists as a granular deposit in the cells of the convoluted tubules, proximals and distals. Occasionally it is also found in the cells of Henle's loop. Many observers have reported that there was no iron to be demonstrated in the glomerular space or in Bowman's capsule. The same distribution has been shown through experimental production of renal hemosiderosis. There is a great uniformity of the pathological and experimental reports concerning this. The convoluted tubule cells are almost universally conceded as being the site of secretion and deposition of iron-containing pigment or simple iron salts. It has been shown that the cases showing the largest amount of iron in the tubules had a lower hemoglobin reading at the time of death than the others. The author states that this may be explained in one of two ways: (1) Either that the anemia is the direct cause of the renal disturbance, or, (2) that at the time, the renal siderosis is most marked, and therefore the effects of the iron most conspicuous.

Experimental work on dogs, which is reported in the article, shows that simple secondary anemia alone does not cause any conspicuous change in renal function or in kidney damage, as manifested by albumin and casts, whereas an anemia with hemoglobinemia, and therefore renal hemosiderosis, leads to distinct renal damage, as evidenced by the fall in the phenolsulphonphthalein excretion and the appearance of albuminuria and casts.

Experimentation has also shown that iron, during its elimination by the kidneys, causes a fall in the rate of water excretion, and a fall in the specific gravity, indicating a diminution of all secretion at that time.

He summarizes his observations and results as follows: "It has been shown that:

- (1) Disturbances of renal function are common in pernicious anemia.
- (2) Histologic examination of the kidneys frequently discloses degeneration of the tubular epithelium.
- (3) There is a deposition of iron in the convoluted tubules of the kidneys.
- (4) Iron in such a location probably causes damage to the epithelium.
- (5) Iron in these cells inhibits the passage of water and total solids, and reduces the specific gravity of the urine.

(6) Fixation of the specific gravity and an increase of the night over the day urine volume is characteristic of the alteration of renal function in pernicious anemia. The correlation of these findings leads to the conclusion that the renal functional changes in pernicious anemia may be attributed, at least in part, to the accumulation of iron in the convoluted tubules, rather than to the anemia alone. The hemosiderosis and the resulting changes in function are so specific that one may speak of this condition as a nephritis of pernicious anemia. It is particularly interesting in view of the fact that the changes are apparently purely tubular, and result from a perverted metabolism."

P. G. BOMAN.

THE CORRELATION OF AUTOPSIES AND CLINICAL MEDICINE IN TUBERCULOSIS: W. B. Jameson (American Review of Tuberculosis, April, 1924). The writer reports 100 autopsies made at the Hamburg (Pennsylvania) State Sanatorium for Tuberculosis.

Ten cases had not shown clinical tuberculosis. One abdominal mass diagnosed as tuberculous proved to be carcinoma with metastasis to lymph nodes. Another patient had an old mitral heart lesion and induration of the liver, spleen and kidneys. Several others showed emphysema and other changes due to inhaled dust in the coal mines. Of the 90 patients with clinical tuberculosis 28 had pneumokoniosis and emphysema, but all cases of lung tuberculosis had emphysema of the air vesicles immediately surrounding the tuberculous masses. The right heart showed changes in the cases of advanced tuberculosis. A portion of the lung is destroyed by cavitation, fibrosis or tuberculous masses and emphysema weakens the usefulness of the rest and a severe strain is put on the heart. Almost all the hearts of this autopsy series showed atrophy and there was always dilatation of the right auricle, ventricle and tricuspid opening and hypertrophy of the right ventricular wall. Again with the inability of the heart to perform its function there was general congestion with cyanotic induration of liver, spleen and kidneys. The size of the heart in this series was not reduced and averaged about 1 to 155 lbs. per body weight as compared with 1 to 162 lbs. or more as given by Piersol's Anatomy for normal hearts. Seventy-three of the 90 cases showed tuberculosis in all five lobes. In only 3 cases was it limited to one lobe. Nearly all had some grade of cavitation. Most of the cavities did not have fibrous limiting membranes. In patients whose condition had been quiescent a year or more, when activity developed and death ensued, the common post-mortem findings were lungs fibrosed at one or both apices with sharply limited cavitation and nearly all the remaining lung tissue studded with tuberculous masses varying in size from one-eighth to a half inch in diameter.

Following a hemorrhage, if there is a persistent elevation of temperature and death ensues, the autopsy is prone to show widely distributed masses of such tuberculous tissue.

The extension of lesions which occurs ordinarily a few months before death involves usually all the lobes and nearly all the vesicular lung tissue. It is surprising how small an amount of air containing lung tissue can support life. Some chests showed only a portion of one lower lobe capable of respiratory function.

In three cases of fatal hemorrhage the source of the

bleeding was as follows: In the first a wide open vessel about one-eighth of an inch in diameter was found in the wall of a cavity near the floor; in the second an aneurysm of a vessel traversing a cavity had ruptured; in the third a globular aneurysm rather more than a quarter of an inch with laminated wall and ragged opening was found.

Spontaneous pneumothorax was found in thirteen cases.

Every case showed chronic fibrous adhesive pleurisy usually greater in the posterior upper region. Sometimes its thickness exceeded one-quarter of an inch. Frequently the entire pleural cavity was eliminated.

None of the patients died soon after the pneumothorax in cases where it was recognized before autopsy.

One case of pneumothorax communicated with a lung cavity.

At 35 of the autopsies typical tuberculous ulcers were seen in the small intestines. Thirty-two showed characteristic ulcers in the colon, and in all the cases there was tuberculosis of the appendix.

One case had a 12-ounce amyloid spleen; 19 showed amyloid changes in spleen; 11 in the liver and 4 in the kidney. An enlarged painless liver is usually amyloid in cases of advanced tuberculosis. Fifty-one gall bladders showed abnormal adhesions to adjacent structures.

In all cases of tuberculosis of the intestinal tract the corresponding lymph nodes were enlarged. The peribronchial and mediastinal nodes were always enlarged but almost never softened.

ARTHUR T. LAIRD.

MERCURIC CHLORIDE POISONING: H. B. Weiss (The Arch. of Int. Med., Feb. 15, 1924), in discussing this subject, has given a very definite outline of the treatment that should be followed in the various phases seen in these cases.

Mercuric chloride poisoning cases are seen not infrequently, and the vast majority of these are among young women who have taken this poison with suicidal intent.

When this poison enters the system it is very quickly taken up, and it has been shown in his experimental animals that the mercury has been detected in the blood three minutes after a tablet was placed in the animal's stomach, i.e., when the dose of the mercuric chloride was .5 gm. per kilogram of body weight. In the smaller doses the time required for detecting it was longer.

From this it is evident that there are not any of the so-called specifics which would be of avail, and that there is nothing which can be used which would combine with the mercury to produce a non-toxic subject which can be eliminated. The action of the mercury is mainly degenerative in character, and affects especially the kidneys. The degree of degenerative changes occurring will depend upon the dosage and the duration of the intoxication. Death results from the kidney injury, although all the organs of the body are affected.

Weiss mentions that one of the most constant findings after bichloride poisoning is an acid intoxication, as evidenced by a reduction of the alkali reserve. There is also a diminution of the concentration of the whole blood chloride. You have a retention of the nitrogenous elements, such as urea nitrogen, uric acid and creatinine.

The urinary findings are significant. Albumin appears early. Soon there is a diminution in the quantity of urine, and this is often the forerunner of a complete anuria. As the quantity of urine diminishes, the organic elements increase, and casts, blood, pus cells, are frequently found. In severe cases the urine is often bloody. The most constant finding has been a highly acid urine. As the intoxication progresses all the signs of uremia may be present. Headache, coma, convulsions, are not infrequent. Generalized edema may occur.

In discussing the treatment he emphasizes the fact that it is exceedingly difficult, and that there are no so-called "specifics." The problem is how to overcome the effects of the poison, and that it is useless to attempt to counteract the metallic poison itself. The logical treatment appears then to be:

- (1) To prevent the progress of the pathologic changes.
- (2) To eliminate the toxic material as soon as possible.

The treatment is divided into several stages:

(a) As soon as the patient comes under observation a stomach tube is introduced, and the stomach is washed with 2 qts. of a saturated solution of sodium bicarbonate. This is continued until the washings return clear.

Before removing the tube, 6 oz. of saturated solution of magnesium sulphate are introduced and allowed to remain in the stomach.

A soapsuds enema is then given.

(b) To introduce alkalines in the system the patient should receive an intravenous injection of alkali as soon after the preliminary treatment as possible. Fischer's solution has been used. This consists of crystallized sodium bicarbonate ($\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$), 10 grms., and sodium chloride 15 grms., both dissolved in 1000 c.c. of distilled water. If this is not available, a solution of 4 per cent sodium bicarbonate may be used. Ordinarily, 1 to $1\frac{1}{2}$ liters can be tolerated without any difficulty. The alkaline therapy should be continued by mouth. The method which he uses for this consists in dissolving 4 grms., or 1 teaspoonful, of potassium bitartrate, in 2 grms., or $\frac{1}{2}$ teaspoonful, of sodium citrate, in a glass of water, orangeade or lemonade. The patient receives 8 oz. of this drink from six to eight times a day from the onset. Hot packs have not been used, except in a few patients who had a complete suppression of urine.

A liberal diet is allowed, including meat, after the diarrhea ceases.

The treatment is controlled by urinalysis, and an effort should be made to keep the urine alkaline to methylene red, and keep it so.

Weiss has treated a series of 135 consecutive patients, with a mortality of less than 6 per cent. He states that the vast majority of the patients placed on this treatment do not develop any evidence of serious kidney disease except for a moderate albuminuria, which rapidly clears. A free secretion of urine is maintained. The patient usually makes a clinical recovery in from twelve to fifteen days. Examination of several of his patients a year after they were poisoned and treated, did not show any abnormality which could be connected with the poisoning.

P. G. BOMAN.

SURGERY

SUPERVISORS:

DONALD K. BACON,
LOWRY BLDG., ST. PAUL
VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

CHILLS OCCURRING EARLY IN APPENDICITIS BEFORE OPERATION AND THEIR INDICATION OF AN OPERABLE STAGE OF PYLEPHLEBITIS: William Thalheimer (Arch. Surg., Mar., 1924). Thalheimer believes that single or repeated chills during the course of appendicitis usually denote septic thrombus formation in the branches of the portal vein. Pylephlebitis is well recognized as a postoperative complication and the author states that it may begin before operation, a chill usually accompanying the onset. If allowed to progress it gradually extends throughout the portal system and sets up multiple abscesses in the liver. These may in turn infect and cause thrombosis in the hepatic veins. From this point the process extends to the lungs, sets up pulmonary abscesses and progresses to fatal termination. In the early stages, where the process is confined to the portal system, the blood culture is negative; later, after invasion of the hepatic veins, it becomes positive.

Thrombosis may occur with any intra-abdominal focus of sepsis, as ulcerative colitis, sigmoid diverticulitis, etc., but is most common following appendicitis. It is most frequently found with the red edematous turgid type, in which the meso-appendix is also thick and edematous and should be looked for in the small radicles of the ileo-colic vein, if necessary nicking the veins with a knife to determine presence or absence of bleeding. If thrombosis is found, the ileo-colic vein should be ligated at a point beyond the thrombosed area and the diseased portion excised. The author cites three cases in which the above described procedure was followed with satisfactory results and a fourth in which permission for a secondary operation was refused which terminated fatally.

DONALD K. BACON.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS
ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

CONGENITAL SYPHILIS: PREVENTION AND TREATMENT: Stewart H. Welch (Arch. of Ped., Feb., 1924). Early invasion of the fetus by the spirochete pallida terminates in destruction of the fetus in almost every instance. Infection of the fetus after the middle of pregnancy may terminate in death. On the other hand, it is

the latter half of gestation which furnishes the living babies who are infected. In reviewing the pathology of the fetus, we find that the placenta becomes the primary focus, and that the organisms are carried to the fetus, not as in acquired syphilis, through the lymphatic system, but in the blood stream. This permits us to separate congenital syphilis from acquired syphilis and to define the former as a maternal infection of the placenta and a transmission of this infection from the primary focus to the fetus by the blood stream. This in contradistinction to the acquired form, or an infection of the primary site which becomes the focus, and the general transmission through the lymphatic system. Proper supervision is just as much a part of the treatment as is mercury. No congenital clinic is complete nor can it promise much success unless a competent nursing staff is available for follow-up visits and to maintain regularity in attendance for treatments. All standard methods of treatment have their applications. The truly specific drug is mercury. Administration by mouth given by parent or foster nurse over a period of two or three years is almost in every instance uneventful, incomplete or otherwise unsuccessful. Inunctions are filthy labels of the malady; a mother soon wearies of her irksome task, and after a short time you can feel sure she will develop inefficiency. Absorption of mercury by the skin is influenced by too wide individual variations. The only satisfactory therapy is the administration of the specific drug by the physician at regularly selected intervals. This permits frequent pediatric check as to the child's general condition, including diet, stools, and weight, and a recorded definite amount and interval of dosage, and safeguards intolerances. Any method which permits quick control, maintains the control, and tends to decrease the duration of needed administration is of inestimable value. With this conviction, the method of choice is the giving of the selected mercurial and arsphenamin intramuscularly or intravenously, and iodides when needed as an adjunct by mouth.

R. N. ANDREWS.

RONTGENOLOGISCHE STUDIEN UBER DIE PERISTOLISCHE FUNKTION DER MAGEN IM SAUGLING-SALTER UND IHRE BEDENTUNG FUR DIE ENTSTEHUNG DES HABITUELLEN ERBRECHENS: Julius Rogatz (Zeitschr. f. Kinderheil., Bd. xxxviii, s. 1-11). Rogatz defines the peristolic function of the stomach as the ability of the organ to concentrically surround and to adapt itself to the volume of its contents. In an interesting and valuable paper, he points out that this peristolic function of the stomach is present in infants, also. It is present, however, only after feeding of thick cereals. He found that a thick feeding of flour and milk became rapidly fluid in the stomach while thick potato and vegetable feedings retained their consistency in the stomach. From a series of x-ray studies of the stomach he points out that after thick cereal feedings the stomach assumes a round or oval form and is reduced to a third of its former size (i.e., when empty). The value of thick cereal feeding to habitual vomiters or babies with pylorospasm is thus placed on a more rational and scientific basis.

DAVID SIPERSTEIN.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

APPLIED PATHOLOGY IN DISEASES OF THE NOSE, THROAT AND EAR. By Joseph C. Beck, M.D., F.A.C.S. St. Louis: C. V. Mosby Co., 1923. \$7.50.

As is evidenced by the title of this monograph, the author has placed before the specialist a definite knowledge of pathologic changes occurring within the respective organs.

The book cannot be considered a textbook (in fact, the author so informs us), as the contents are based entirely upon the author's personal experiences. Treatment is advocated on the basis of the respective pathologic conditions present. The book is adapted both for the general practitioner and specialist, perhaps appealing more to the latter for its concise and explicit manner of placing the subject matter before the reader.

The book is profusely illustrated and from the book-maker's art has been well put together.

GEORGE C. DITTMAN, M.D.

MANAGEMENT OF DIABETES. George A. Harrop, Jr., M.D., Associate in Medicine, College of Physicians and Surgeons, Columbia University, and Assistant Visiting Physician, Presbyterian Hospital, New York. Introduction by Walter W. Palmer, M.D. 190 pp. New York: Paul B. Hoeber, 1924. Cloth, \$2.00.

HOSPITAL ORGANIZATION AND OPERATION. Frank E. Chapman, Director Mt. Sinai Hospital of Cleveland. 285 pp. Illus. New York: The Macmillan Co., 1924. Cloth.

FIRST STEPS IN ORGANIZING A HOSPITAL. Joseph J. Weber, M.A., Editor *The Modern Hospital*; formerly executive secretary Committee on Hospitals, State Charities Aid Assn. of New York; Associate Director, Boston Dispensary. 220 pp. Illus. New York: The Macmillan Co., 1924. Cloth.

COMMON DISORDERS OF DIGESTION. John L. Kantor, Ph.D., M.D., Chief in Gastro-intestinal Diseases, Vanderbilt Clinic, Columbia University; Associate Gastroenterologist and Associate Roentgenologist, Montefiore Hospital for Chronic Diseases, New York City. 245 pp. Illus. St. Louis: C. V. Mosby Co., 1924. Cloth, \$4.75.

THE SCIENCE AND ART OF ANESTHESIA. Col. Wm. Webster, D.S.O., M.D., C.M., Professor of Anesthesiology, University of Manitoba Medical School; Chief Anesthetist, Winnipeg General Hospital, etc. 214 pp. Illus. St. Louis: C. V. Mosby Co., 1924. Cloth, \$4.75.

DIABETES. Philip Horowitz, M.D. 231 pp.; 34 text illus.; 2 color plates. Second edition, revised and enlarged. Cloth, \$2.00. New York: Paul B. Hoeber, 1924.

GASTRIC AND DUODENAL ULCER. Sir Berkeley Moynihan, Leeds, Eng. 48 pp. 2/9 post free. Bristol, Eng.: John Wright & Sons, 1923.

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MINNESOTA MEDICINE

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Northern Minnesota Medical Association and Minneapolis Surgical Society*

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ORIGINAL ARTICLES

TWENTY YEARS' OBSERVATION OF TUBERCULOSIS CONTROL IN MINNESOTA *

E. L. TUOHY, M.D.

Duluth, Minn.

This period includes my final year in the medical school, a period of some years devoted to public health in an outpost of the State Board of Health in Duluth, a year of graduate European study, chiefly in Vienna, in 1912, and the decade following thereafter. In this period I have had my connection with Nopeming Sanitarium, as chairman of the Tuberculosis Commission appointed by St. Louis County.

I must state that in the more recent years the problems concerned with tuberculosis have been merged into the consideration of a multitude of others customarily encountered in the diagnostic and therapeutic problems of a general clinic and hospital practice.

It may seem presumptuous to you to have me make this segmental analysis, basing it upon my own life experiences. Nevertheless, this has been a very active period in public health as a whole, and any statistical analysis of the reduction in death rate, including those from tuberculosis, will show that much has been accomplished. Presently the great problem before us is to continue the good work and to focus our attention upon the situations immediately facing us, because further declines in death rates are not likely to come as easily as is sometimes supposed.

Considering that little was done in Minnesota up to twenty years ago in tuberculosis prevention, points the obvious fact that there was much to do; that which remains to be done, even in a winning contest, will require much co-operation and foresightedness.

In 1904 it seemed to our clinical teachers that the outspoken problem in pulmonary tuberculosis was to *find the early case*, in order to cure it. The teaching of the Germans, Brehmer and Dettweiler, had borne fruit; the beacon of hope lighted and tended through years of struggle in the Adirondacks by Trudeau, had been sighted all over our land; Massachusetts, in 1898, had led the way with a state sanatorium; Minnesota was gathering plans for the institution at Walker; all were intent on breaking down the awful conviction of the average intelligent man: "Consumption is incurable." In that year of teaching, when exact and firm rules were laid down regarding the diagnostic use of tuberculin, the National Association for the Prevention and Relief of Tuberculosis was formed. Tuberculin, and with it all specifics for practical therapy in pulmonary tuberculosis, has been a failure; the National Association and its widespread branches have been a profound success.

We should record in passing that no early sanatoria got the "incipient" cases they were looking for; there were no "preventoriums" such as this institution where this meeting is held tonight, which is such a brilliant and successful example. Some of those we rounded up with ripping reactions after tuberculin took us very seriously; most of them sought medical advisors with less curiosity as to tuberculosis immunity, but better judgment as to general competency. Most cases labeled "incipient," and with "a slight touch in one apex" at home, were advanced cases when they got into the burdened institution. Non-tuberculous lesions of the lungs got scant courtesy from the general man, and the specialist even now is not free from the accusation that he is slow to consider them. In short, 1904 to 1912 was a period of rising hope on the part of doctors, but the deepest of despair on the part of patients, toward consumption; this disease provided the great predominant *fear* implanted in the minds of the persistently sick—a place now most certainly usurped by the fear of cancer. (We might well discuss in passing the grave need on the part of the medical profession of abating sense-

*Read by invitation before the medical staff of the Lymanhurst School for Tuberculous Children and the Parkview Sanatorium, June 27, 1924.

less fear. Particularly is this necessary where our well planned educational efforts yield the unhappy by-product of apprehension on the part of those who misapply our instructions or get them badly mixed up.)

The International Congress on Tuberculosis in Washington in 1908 had a most profound impression upon tuberculosis in America. From it some of us brought back some deep convictions that have meant much to the campaign in Minnesota. It is doubtful whether many states have plunged into a campaign any more heartily than did Minnesota; few states have been as rapidly or as successfully institutionalized for the prevention and care of tuberculosis. Newsholme and Koch were the outstanding figures of this congress. It may seem incongruous to mention them in the same breath; the one a statistician, the other a medical hero. Nevertheless, Koch, at the Congress, was like a general returning after a great war; his work had been done so well that even he never improved upon it; he was expected to produce a specific cure, and was never able to do it; therefore, he graced the program by his presence. Newsholme made the program. After the Russians had finished dangling their numerous medals; after the bearded French had ceased sputtering; after even the American "Billy Sundays"—each and all had ornamented the great record of the Congress—we all went home remembering chiefly what Newsholme had said, "We are checking tuberculosis in England by hospitalizing the advanced cases."

Another incident of the Congress is well worth recording. In a back recess among the exhibits were some roentgen plates from the irascible but most ingenious pioneer in roentgenology—Cole of New York. I was among the many who gave the few pictures he had a most casual glance and hastened on to a digest of the "57 varieties of tuberculin." There were indeed those present who were vehement about the preposterousness of injecting any such mechanical objective artifice into a problem that was so obviously subjective and concerned only with the diagnostician's cerebrum properly linked up with his own pet stethoscope. Now, in retrospect, it is evident that this despised artifice has become a "godsend" to clarify the many disturbing questions involved in proper and safe chest diagnosis. To it is due much of the honor of lifting the fear of tuberculosis from the souls of that frenzied fringe of humanity that is always the first

to drink in our health propaganda, and who are invariably the ones least in need of the draught. Chest roentgenology has done much more, but this is only a sketch and not a proportionate tribute.

At this point I wish you to travel in imagery to the confines of the "Kinder Klinik" near the Allgemeine Krankenhaus in Vienna. The time is April, 1912. Hamburger it was who talked when I entered the room. He was looking at a von Pirquet reaction on a child's arm, and he was putting forth dispassionately the story of "the primary lungen herd" in tuberculosis. This was my first introduction to the idea that tuberculosis was not the result of a cumulative exposure, on the same principle that one gets wet if it rains long enough on ordinary clothing. Soon thereafter I was permitted on numerous occasions to see the classical finding of "truly incipient tuberculosis" in the lungs of children autopsied under Erdheim. I became tremendously imbued with this most striking pathological entity. This explained why we did not have any "incipient tuberculosis" either in our offices or in our sanatoria at home.

The contention of only one probable infection with tuberculosis, and that in childhood, has gained American recognition very slowly. So far as I know, the pediatricists as a whole have quite accepted it; the older American internists have likely been the most skeptical. It is quite inopportune to further discuss the arguments pro and con that have been so much mooted. In like manner, it is quite useless to agitate the question relative to the relationship in childhood infection of bovine or human tuberculosis. Let us agree that no doubt adults may acquire tuberculosis freshly; let us likewise agree that the bovine bacillus may infect children; but, let us just as eagerly and willingly agree that most children now inoculated will get this insult via the bronchial tree from a human source; that tuberculous cattle are unprofitable and should be exterminated. Any pathologist who is willing to carefully autopsy the lungs of children will find, if he is willing to look for them, the single or multiple nodes, usually in the lung periphery, with regional lymph gland enlargement, the infectious tract being virtually the "chancre of tuberculosis." Reinfection is possible in any disease, but it is not likely with many infectious, including typhoid and syphilis. The idea of a single infection or inoculation with tuberculosis is not incompatible with the soundest reasoning and keenest analysis. It has

steadily driven home to us the inevitable conclusion that it is impossible to house children and open cases of tuberculosis in the same room; it is unreasonable to expect that highly virulent organisms fresh from the host in probably massive dose, will not produce an inoculative lesion that may not only check the immediate life of a child but challenge its likelihood for continued growth and existence at any time thereafter. It also focuses our attention upon the likely fact that casual inoculation in open places, where sunlight vitiates the strength of the organism, likely produces an attenuated organism vaccination that explains much of the specific immunity known to exist in the body fluids in such a large portion of the population of civilized areas.

In retrospect it is easy to see that much was accomplished by our early exhibits, featuring tuberculosis. They attracted large crowds and stimulated the interest of a great number of voluntary workers that did much to bring about favorable legislation and inaugurate the various movements that led to regional sanatoria, the employment of visiting nurses, the development of diagnostic clinics, and the other agencies now so well known. Not a few of the early local anti-tuberculosis societies formed have since disbanded, realizing that their work has been taken over fully and effectively by local health boards or those connected with county sanatoria. In fact, it is easy to see that other matters of grave interest, not excluding the studies in psychology, have taken up the attention of an intelligent segment of many of our localities, who would be more or less bored if the original though successful primary campaign against tuberculosis was continued in the same manner and with the same instruments. These changes, instead of being an evidence of early failure, have rather been an indication of the gradual attainment of the objective sought. The Minnesota Public Health Association, in greatly enlarging its scope of work, and including much effort particularly among children, has certainly made no mistake, and these departures are to be commended and encouraged for the future.

A statistical study, based upon Minnesota records, and attempted by the writer at this time, has seemed to reflect only dimly the real success of the campaign. It is well known to all of you that the general death rate of about 200 per 100,000 of population in the United States, at or about the

year 1900, has been reduced to about 100 per 100,000 at the present time. This means the saving of a hundred thousand lives in the United States yearly. According to the impression of close students of statistics, such as E. I. Lubin, this decreasing death rate will mean only one-fourth as many deaths in 1930 as there were in 1900. It begins to look, therefore, that the slogan, "No tuberculosis in 1950," may not seem impossible. In determining how we may continue to decrease the incidence of tuberculosis, we naturally fall upon the expedient of attempting an analysis of the factors involved in the known amelioration up to date. Only a few of these will be touched upon, including such matters as the virulence of the tubercle bacillus, the general resistance of our population, the influence of immigration, education, and our general standards of living. We should consider more fully just the type, size and general utility of our various sanatoria, upon which we know the greatest burden in our fight is still to rest. It must be fully apparent to those who have given the matter study, that the entire burden of the fight, however, cannot be left upon the shoulders of those conducting these institutions; it is the belief of Dr. Robinson Bosworth and of many others who are familiar with the situation, that we cannot abandon certain phases of "properly supervised home treatment." These, and many other factors, present themselves, but time will not permit their analysis.

THE PRESENT VIRULENCE OF THE TUBERCLE BACILLUS

There is an intimation that the bacillus tuberculosis, like bacillus lepra, is losing some of its virulence. This possibility can be briefly disposed of by considering the present morbidity and mortality from tuberculosis in known areas of Central Europe where careful observations have been made. The recent visit to this country of the well known pediatrician Finklestein brings to us the definite observation of a most careful man, that the increased incidence of tuberculosis in Germany has gone hand in hand with a reduction in the amount and quality of food known to be so essential to the young. This is known to be a war heritage wherever starvation is mercilessly persisting. It is even possible that this kind of temporary starvation may have a more vicious influence upon a people than the type of chronic and persistent starvation as is witnessed more or less constantly in Mexico. In that unhappy country, where a traveler notes, "Twelve

millions of them are forced at war times to go half starved, and in peace times are always underfed," it is even possible that a degree of hardness encompasses the survivors, reducing the ordinary influence of malnutrition. This is not the case in a country like Germany, where the best of public health and disease prevention obtained and the economic structure of the land was very cohesive. Hence a debacle such as now is present submits its population to a scale of living and nutrition that gives their natural immunity little chance. This thought would need far greater amplification, but I am sure that the supposed predisposition to tuberculosis of the Irish race as a whole was acquired from the experience of those hordes of Irish immigrants who came to America after the famine of 1840 to 1850. The Irish children that survived that unnecessary blight and were the parents of the next generation of Irish-Americans were the unhappy folks who gave to my own race a good name in fighting everything except tuberculosis. It wasn't the fault of the race, but the dastardly potato that refused to grow, aided by the cupidity of blundering English landlords.

THE RESISTANCE OF OUR PEOPLE

It is likely that every epoch in history has fancied that the standard of living attained has been so far out of proportion to that previously obtaining that grave fears were held as to whether it might be continued or sustained. As far as the question of feeding and resistance is concerned, it would seem difficult to ever produce a situation where fewer people were necessarily subjected to undernutrition than in expanding America. No doubt as population increases and the strife of existence becomes more onerous, we also will arrive at some such situations as have recently come to pass in countries even as well organized as England, particularly where economic stresses attendant upon unemployment arise. In fact, many observers, instead of fearing that our people are to suffer from undernutrition, rather fear a wholesale tendency to obesity and hyperpiasis, with resultant degenerative diseases hastened by too rich and too high living, and too little physical exercise!

As far as we are concerned as physicians, the obvious need is shown for us to continue our interest in everything that will keep our people properly employed, with suitable hours of working, and with a stability of existence based upon a fair and equitable relationship between the forces controlling our national resources and developing our

industries. This, in a word, calls for an intelligent interest on the part of all physicians in our civic and political growth. We are possibly inclined by nature or by social environment to constantly feel a suspicion of those striving for better hours of labor or higher wages, but it is manifestly to the advantage of general health conditions if the great force of working people not only in our cities but on our farms are prosperous and contented. It is our duty to work insofar as we can, as individuals and citizens, to bring such states about.

PROBLEMS OF IMMIGRATION

It is doubtful whether those who have recently drafted the immigration law have had in mind the possibility of temporarily shutting out from our shores those who have been recently subjected to the vicissitudes of malnutrition and starvation. While it may seem a turning of our back upon the older idea that our shores should be the haven of all those distressed, either mentally or physically, it must be clear at the present time that there are in large areas of Europe just the type of underfed and stunted children who could well in the next two decades become strong prospective candidates for active tuberculosis. This may be additional reason why the present restriction of immigration is worth while.

THE TRUE VALUE OF EDUCATION

Education is always mentioned as one of the chief advantages of our so-called "institutional care." Let us ask, how and why? It is fortunate that education has an influence in the mass that is often by no means reflected in the individual. Many animals have been trained either to trap their fellows or put them to work: witness the falcon and the elephant. A fair sprinkling of mentally alert individuals at strategic points keep a horde of near morons reasonably employed. Hence, education has a reputation far out of proportion to its real worth. Education and intelligence are confused: the one may be acquired—the other is a birth asset, compared with which all the earthly bestowals of chance or fortune are as mists before the mounting sun—a cataclysmic realization, is it not, and one we are often too slow in arriving at! As a man is born so he dies. Years of education are as surely wasted on some humans as if Michael Angelo had done his heroic tracings in the sand. Those of you who have said so much about "teaching the patient how to live," should well ask yourselves the question, "Who among those I am treating are capable

of being taught?" This answer can certainly neither be easily nor lightly given. This problem can be more clearly seen, possibly, by simply noting that it is totally impossible at the present time to give our best and most successful treatment for diabetes to the patient who is incapable of being taught. It is certainly accepted that it is impossible to treat the unteachable patient with insulin. Much time would be saved in many of our institutions and clinics if a conscientious effort would be made to find out those tuberculous patients who are fundamentally incapable of being taught. Their future control could then be determined, with the addition of such coercive measures and such restraint as would safeguard others. The rest could often profit greatly by more intensive personal training, where more time was available for them. The campaign of general education is going along splendidly, and it is doubtful whether we could improve on it much at the present time.

THE FUTURE WORK OF OUR VARIOUS SANATORIA

It is difficult for those familiar with the work done by our sanatoria to minimize their importance

in whatever success the anti-tuberculosis campaign has so far accomplished. It is likely that far too much of the burden involved has been forced upon them. Dr. Robinson Bosworth, of the State Tuberculosis Advisory Commission, has kindly provided for me the data relative to the development of our state and county institutions, and this is shown in the accompanying Chart I.

It will be noted that this list, with bed capacities, does not take into consideration certain well known private institutions and those beds that are available in conjunction with other public or private hospitals. It is likely that the number of such beds is going to increase as the rightful responsibility for the proper teaching of interns and nurses in the matter of the care of the tuberculous becomes more widely understood.

The data presented in Chart II, while incomplete and offering only a comparison between the beds discussed in Chart I, and the death rates as given by the State Board of Health, is nevertheless significant, because it is apparent that very soon, if not already, we have, in the institutions controlled

CHART I

<i>Sanatorium</i>	<i>Location</i>	<i>Date of Opening</i>	<i>Capacity</i>	<i>Increases</i>	
State Sanatorium	Ah-Gwah-Ching	Dec. 27, 1907	60	80	1910
				95	1911
				130	1913
				170	1914
				240	1915
				280	1918
				325	1923
Nopeming	Nopeming	May 22, 1912	50	225	
Otter Tail Co.	Battle Lake	Nov. 4, 1913	37	46	1915
Ramsey Co. Pavilion	St. Paul	Sept. 14, 1914	124	None	
Mineral Springs	Cannon Falls	Nov. 1915	34	40	1922
Sand Beach	Lake Park	Dec. 3, 1916	26	34	1921
Sunnyrest	Crookston	June 13, 1916	30	46	1921
Lake Julia	Puposky	June 12, 1916	27	48	1921
Riverside	Granite Falls	April 29, 1917	40	50	1920
S. W. Minnesota	Worthington	July 25, 1917	45	55	1921
Buena Vista	Wabasha	Feb. 1, 1917	20	None	
Oakland Park	Thief River Falls	Dec. 31, 1917	24	32	1922
Fair Oaks Lodge	Wadena	Fall, 1916	24	30	1922
Deerwood	Deerwood	Fall, 1916	24	None	
Glen Lake*	Oak Terrace	Jan. 4, 1916	73	100	1918
				190	1921
				262	1922

*500 capacity early summer of 1924.

Steele, Freeborn and Faribault Counties, opening 1925, probably.

by the State and County alone, a very close approximation of the same number of available beds for tuberculosis as the current yearly death rate. You will remember that this was a desideratum aimed at and only dimly hoped for in the earlier years of the anti-tuberculosis crusade.

CHART II

STATE AND COUNTY SANATORIUM BEDS AVAILABLE,
AND AVERAGE FOR FIVE YEAR PERIODS FROM
1905 TO 1923, WITH DEATH RATE PER
HUNDRED THOUSAND AND THE AVERAGE YEARLY DEATH RATE

	Average Beds Available	Average Death Rate Per 100,000 (All Forms)	Average Deaths For 5 Year Periods From Tuberculosis
1905 to 1910	70	106.4	2111.4
1910 to 1915	245	110.2	2368.8
1915 to 1920	627	102.09	2364.4
1920 to 1923	1100	77.76	1901.25

In the year 1921, 5,200 cases of tuberculosis were reported to the State Board of Health. In the same year there were 1,880 deaths. In 1922 the proportion was of 4,229 reports to 1,726 deaths from tuberculosis. Taking the year 1922, it will be noted that by multiplying the number of deaths by 2.5 we get a rough approximation of the number of cases reported. This is of particular interest because it was formerly much in vogue to state that for every death from tuberculosis there were five active cases preparing to die. Thus it would seem that in 1922 approximately one-half the cases were reported, which, all things being considered, is a rather fair attainment.

With a continued and successful fight, it would not appear, theoretically at least, that we should need any elaborate and marked extension in the number or size of our tuberculosis sanatoria. There is a large educational value accruing from the distribution of institutions, regardless of size, in various strategic points within the state. There remains at the present time no very large area of our state that is not fairly well represented. When some of the southern and southwestern portions of the state are better covered, we may point with pride to a splendid equipment with which to still further arrest the ravages of tuberculosis.

Chart II furnishes no convincing evidence at the present time of any exact relationship between the decline in the death rate and the building and extension of our sanatoria. Insufficient time has elapsed. In general, those writing on this subject

are prone to quote the statistics of New York City, not only on account of their striking figures but because they have had reliable vital statistics for a much longer period than most of us here in the west. Unofficially, however, it must be obvious that the present generation of children in Minnesota has been enormously safeguarded and protected by the fighting forces distributed and linked up within our state through our sanatoria. It is my belief that whatever development may come in the future, we should hold rigidly to keeping our tuberculosis clinics and our tuberculosis visiting nurses in the closest touch, if not under the same control, with our institutions. Our goal must be to have accurate registration within our district of every known active consumptive, and there is no better place for the assembling of this information than in our sanatoria. The information there collected may be freely transferred to the various health boards and to the state board of health, but the actual control, direction, guidance and supervision is obviously not so much an administrative problem as it is a personal one. Where this cannot be carried out by the patient's own physician, the nurses in connection with the tuberculosis clinics, and the doctors in connection therewith, and the institutions in which most of these patients have spent more or less time, are those best able to provide this needful and necessarily diplomatic oversight.

Dr. Lawrason Brown indicated for the American Sanatorium Association in 1920 the following standard:

"In order to qualify as a Class 'A' institution a sanatorium must have a resident physician and assistant resident physicians, one for every fifty patients up to one hundred and fifty, and then one for every seventy-five."

These quotations are simply introduced at this time to indicate that the problem before our sanatoria is something very different from simple housing. It is evident that a variety of situations is arising, and special extensions of treatment, such that no institution can afford to be without such vital and necessary hospital adjuncts as well equipped operating rooms and the best and most modern roentgen laboratories, and, if any worthwhile research is to be done, well equipped and manned pathological laboratories. Compression of the lungs, either by artificial pneumothorax or by extrapleural thoracoplasties, must be done in suitable

cases, and much of this requires not only a well balanced hospital staff but also such consulting staff appointments, that the various surgical and medical specialists needed for the proper conduct of medical treatment in an up-to-date manner will be available.

This suggests the inadvisability of the further development of small institutions needing such elaborate staffs and finding it difficult if not impossible to have them. It may even be essential in time to work out a system of co-operation and transfer between institutions, whereby those equipped for more intensive therapeutic endeavors may have an opportunity to focus upon those patients which time and experience will indicate may profit greatly thereby; some of the others might continue to carry out the less elaborate procedures.

It is increasingly more evident that even such simple procedures as the application of heliotherapy, Alpine light, ordinary sunlight, cannot be done in a hit-or-miss manner, but must be conscientiously and carefully supervised by those who know what they are doing.

It is useless for those in control of tuberculosis sanatoria to figure how a few dollars may be saved in their conduct. The monthly reports furnished by these institutions clearly indicate that the cost is now and always has been kept well within the average for our entire country. At the same time, it is never going to prove ultimately economical, and certainly not effectual, if we are to further depress our tuberculosis death rate, if the men who are willing to give their time and life work to these institutions are not properly compensated with reasonable salaries and given the equipment to work with. Let us look for a broadening of the scope of therapy within our institutions, and let us back the men up who are to bring this about. Let those of us outside the institution be willing and eager to furnish any and all consulting aid that is essential. By this harmonious co-ordination the effective work will go on.

GENERAL PRACTITIONERS OF MEDICINE MUST AGAIN BECOME INTERESTED IN TREATING PUL- MONARY TUBERCULOSIS

The whole problem of the care of these patients would be greatly simplified if the disease were not so wretchedly chronic, and, like typhoid fever, either yielded a reasonably prompt mortality or a recovery, accompanied by enough physical endurance to re-engage in ordinary occupations. It is

well known that many tuberculous patients neither get well nor die, but remain "status quo."

Dr. A. T. Laird, of Nopeming Sanatorium, has furnished the following data:

Between the years May, 1912, and May, 1924, 1,909 patients have been discharged from Nopeming Sanatorium. In tracing these it is known that 1,073 have died; 209 have moved away from the county; 408 are not to be found; 112 are said to be non-tuberculous. This leaves a grand total still living within our county of 407.

As to the present number of tubercle bacilli producers known to live within our county, the following table is instructive:

	Positive Sputum	Negative Sputum	Total
Patients now at Nopeming.	105	91	196
Former Nopeming patients	127	280	407
Reported from other sources	174	488	662
Total	406	859	1,265

Recently Dr. Robinson Bosworth and Dr. A. T. Laird have been co-operating in an attempt to evolve a plan whereby our institutional beds might be the more effectively utilized for the active treatment of those cases of tuberculosis that are likely to yield the maximum of results. It is surmised that there must be a fair number of patients of such intellectual capacity and of such physical and pathological status, as to be able, under proper supervision of visiting nurses and their home doctors, to utilize to a considerable degree "properly supervised home treatment." Dr. A. T. Laird has appeared before our St. Louis County Medical Society, and has instilled a considerable amount of enthusiasm into the members who heard him, relative to a plan to bring them into closer co-operation with his staff, with our tuberculosis clinics, and the various nurses in the field. There is presently a distinct danger of the various organizations at work "to pass the buck from one to another." It is my contention that as far as the average private physician is concerned, he has passed up almost entirely the matter of the treatment of the tuberculosis patient, and expects the sanatorium to look out for him indefinitely. This is fortunately as illogical as it is unnecessary. The same complaint has been made relative to our insane asylums and institutions for the feeble-minded, and on the whole is a reflection upon the sincerity of our fellow prac-

tioners who present an agonized protest to any suggestion of instituting various grades of "state medicine." Nevertheless this considerable segment of practice is abandoned, and the doctors furthering this plan are sincere in the belief that many well trained patients will be perfectly willing to employ their home physician and pay him for his services, *provided he shows enough interest to familiarize himself with the principles involved and proceed along with the patient in the attainment of his cure.* We may again here utilize the example of diabetes: for a patient who has had good training in dietary control of diabetes to consult a physician who is totally unversed in caloric values and manipulation is to destroy at once all confidence in the physician's advice and judgment. No matter how distasteful the *teaching features* of our professional function may be, we cannot avoid them.

It is to be hoped in our county that an increasing number of men will avail themselves of Dr. Laird's invitation to come to Nopeming, take part in clinical conferences, and become familiar in an intimate way with the actual detail of modern tuberculosis therapy. It is certain that in recent years the application of the cardinal principles of rest, food, fresh air, and, presently, heliotherapy, have been advised in an altogether too general manner; too much of the idea, "Be good and you will be happy." What is needed is some of the same intelligent application of correct principles in private practice as is now seen in our special clinics and hospitals.

Granting, however, the limits of instruction to which our kindly but busy confrères will submit, it must be convincingly evident that a very great field presents itself for the better instruction of our medical students and interns who are to be the active practitioners of the next two decades.

Dr. D. A. Stewart, the well known tuberculosis authority and medical director of Ninette Sanatorium, Manitoba, has done particularly good pioneer work in the matter of utilizing medical stu-

dents sent on from Winnipeg "for one month's residence at the sanatorium—an official part of their medical course." This has been done to a limited degree by our own state university, but our various sanatoria should arrange so that every graduating student might have at least a month or possibly more.

Interns graduating from our hospitals, with their final year of clinical work, should have their courses so arranged that part of that time might be spent in direct contact with those constantly teaching and directing this work. It would seem that very little effort is now needed to bring this about.

THE ACTUAL SUPERVISION OF EVERY KNOWN POSITIVE SPUTUM CASE

Finally, it must be quite evident that if every positive sputum case were under such supervision and control as to give him such surroundings as to make unlikely the infection of others, the control of tuberculosis should be just as sure as that of yellow fever where the mosquitoes are not allowed contact with the infected human. We would undoubtedly find that very few individuals securing this control would have it forced upon them unwillingly. Sanatorium trained physicians are always keen upon the feature of providing such opportunities for work and self sustenance as are hinted at in various "colonies" provided for that purpose. Even where this excellent development has not come about, have we not at the present time an extraordinary network of public health agencies with many visiting nurses in the field, all of whom could be readily drawn into the plan, which has for its ultimate intention, as far as tuberculosis is concerned, *to place a hypothetical cordon about the positive sputum case, rendering it easy for him to do his obvious duty in safeguarding his fellowmen?* The work necessary to bring about this next vital step is one of the most engaging problems before us.

THE DECLINE IN TUBERCULOSIS AS REVEALED BY POST-MORTEM EXAMINATIONS*

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During the six thousand years of written records of human events, accounts of devastating epidemics have appeared with steadily increasing regularity, and, on many occasions, with appalling results. No one single class of historical data rests on such certain foundations as the essential facts concerning these epidemics, which begin, often at accurately determined periods, increase in severity with varying degrees of rapidity until the high peak of incidence is reached, and then wane, gradually fading out into the unrecorded level of the ordinary ills and accidents which constantly afflict the human race. As the art of writing became more widespread, the waves of these epidemics could be traced with increasing accuracy to neighboring peoples along the lines of human communication, sometimes spreading with almost incredible rapidity, but always repeating the cycle of development and regression which is the predominant characteristic of all major plagues.

With the increasing complexity of international relations, the course of minor or more chronic epidemic diseases becomes increasingly difficult to trace, and only those with rapid rises, high percentages of afflicted persons and severe results, may be carefully studied as major events in history. Consequently we become prone to regard an "epidemic" as a disease that comes on fairly rapidly, reaches a clearly perceptible crest, works horrible havoc and then disappears.

In the earlier instances of such epidemics, ignorance with respect to their cause or manner of spreading, and the awful, irresistible onward march of the destructive "thing," in short, the universal mysteriousness of the whole process, justified the conclusion that only the gods or devils could have produced such absolutely inexplicable results. It was not until the latter part of the last century when the parasitic nature of most of these diseases was demonstrated, that rational study of them became possible, although it cannot be too strongly emphasized that the essential facts with respect to their

cyclic manner of occurrence had been indisputably established long before any clear conceptions of their cause had been reached.

However, it must be admitted that, with the exception of their wave-like tendencies and certain well established clinical and pathologic characters, the real nature of most epidemic, and many endemic, diseases only became known when the microscope, the culture tube, and experiments with laboratory animals revealed the true relation between invaded host and invading parasite, and that, in the short period of the last forty years, more knowledge about the behavior of host and parasite has been gained than in the entire thousands of preceding years. We now know that every form of animal and vegetable life suffers from pests and pestilences; the prey is preyed upon, and the extent of the battle of all living matter against the so-called natural forces of earth, air and water is readily comparable with, and perhaps exceeded by, the importance of the struggle against living foes of every conceivable variety and form and every possible degree of destructive power.

With this intensely rapid accumulation of facts concerning parasitology in its broadest sense, and the "close up" study which we now give to the habits of the contending agents, the salient points brought out by historical studies are likely to be ignored. We tend to disregard the past because of the partial ignorance which it so plainly exhibited, and we often appear to date history, with respect to disease at least, from a comparatively recent period. The complete acceptance of such an attitude will inevitably deprive us of a certain useful understanding about the natural laws of epidemics, which can only be gained by the consideration of diseases, not in terms of days, months or years, but of decades, generations or even centuries. Only when this historical background, reinforced by our present knowledge, is given full recognition, will some of the still numerous, unexplained puzzles concerning the evolution of parasitic disease receive a satisfactory solution.

The first fact that becomes pertinent in this connection is the ever-changing relation between all hosts and all disease-producing parasites. While the individual struggle between the lives of these contending forces may sway from side to side, now the host and now the parasite attaining the ascendancy, ultimately every such contest must end with the death of one or the other of the contestants.

*Read before the National Tuberculosis Association, Atlanta, Georgia, May, 1924.

No other solution is possible. In any single contest many factors may unite to give victory to either side: in epidemics, on the contrary, at least those attacking man, at first a group victory is achieved by the invading organism, but later, and always up to the present time, the host, as a group, has ultimately cast off the parasite and become temporarily, as a species, relatively immune and inimical to its efforts to live and do harm.

This cycle of events is so strongly evidenced in world-wide or local epidemics of acute diseases that we expect it, and we believe that this curve of evolution, including subsidence, must perforce occur even if we give little thought to the reasons for such a belief. These reasons, however, may be largely based on a study of the historical aspects of such diseases, sufficient periods of time having elapsed to enable us to view entire epidemics as entities, and to survey enough recurrences of the phenomena to enable us to establish fairly well definite laws concerning their behavior.

While the wave character of acute contagious diseases seems to be a firmly grounded principle, the same tendency with respect to more chronic or widespread affections is either not recognized at all, or the application of this law is wholly denied. This mental attitude is, of course, unreasonable and also unreasoning. Disease cycles may be very long, they may even, although probably rarely, take centuries to finish their course, but in the end the wave *must* finish its rise and inevitable fall, and the particular parasite as a group infection *must*, temporarily at least, cease to be a menace to its particular group host.

Of course, it is conceivable that the invading group might come off wholly victorious and the invaded host perish as a result. It is even conceivable that the human species may sometime be wiped out by some especially harmful form of infecting agent. Such, however, is not the teaching of evolution, or (if the word should be taboo) of history. Our vision is, unhappily, extremely limited, but so far as it can pierce the veil of the future, relying on the knowledge of the past, to that extent, we can rest assured of the perpetuity of the human race or some species closely related and developed from it. This certainly holds so far as any struggle between living organisms is concerned, even if it does not obtain in the eternal struggle against the natural forces of the universe.

But whether the human race is ultimately to de-

velop into a more complex species or is doomed to extinction, we are chiefly concerned at present with the hopes we may entertain of victory over certain of our more persistent parasitic enemies. Specifically stated, we wish to know what prospect the human race has of becoming free from the menace of smallpox, typhoid fever, measles, and the other acute infections, and whether there are any signs at present that the more chronic and hopeless sort of plagues, such as syphilis, leprosy and tuberculosis, will ever disappear.

As a general proposition, in view of the position just outlined, it can be confidently affirmed that, in the very nature of things, not only the acute contagions but also the chronic ones, if due to pathogenic organisms, must eventually entirely succumb in their struggle with man as a host. That new and more deadly parasites may take their places is not only possible but even probable, but that the particular diseases now afflicting man must run out their cycle to their own destruction seems as clear as any one fact in the history of the race. In Nature's laboratory there can be no such thing as a permanent parasitic disease.

The general argument might be easily developed in richer detail, with the citation of innumerable examples from both ancient and recent history, but my task is not now directly concerned with anything more than the bare outline of the thesis which has been mentioned. On the other hand, it is directly concerned with the evidence which may be found to show that, with the huge plague, tuberculosis, there are definite, seemingly unmistakable, signs that its menace is diminishing, and that as a pandemic the downward side of the cycle has been reached. Favoring this view, much general evidence gathered from comparison of mortality and morbidity statistics could be, and has been adduced, but I intend to confine myself to the evidence gathered at post-mortem examinations, and present facts which show a rather remarkable change in the reactions of the people of North America toward the bacillus of tuberculosis. In the routine conduct of post-mortem examinations, the lesions of tuberculosis are often among the most prominent, most easily identified, and least often overlooked. Consequently, statistics concerning them have a somewhat greater validity than many other and more obscure diseases. Hence, it is natural that all pathologists should be struck with the comparative frequency of various forms of tuberculous

infection, from the fulminating type of ulcerative pulmonary tuberculosis with pneumonia and generalized miliary distribution, to the tiny calcareous concretion in the peribronchial or other lymph nodes. So widespread has been the knowledge thus obtained by pathologists that the oft repeated statement that from 75 to 90 per cent of all civilized races show evidences after death of some sort of tuberculous infection is universally accepted. The character of these lesions has been described in rich detail, and all physicians, and many who are not physicians, have a fairly accurate conception of the manifold classes of reactions which occur between the virulent bacillus of tuberculosis and its often more virulent human host.

Our attention has thus been focused on the diagnosis, the effects and the treatment of the disease, and too few attempts have been made to detect or to measure the changes which must have occurred in the mass relations between the bacterial parasite and its human host. As has been previously emphasized, the word "must" is used advisedly. The plague is either increasing, at its peak, or on the downward side of the curve.

For the last two decades I have been deeply interested in the character and incidence of tuberculous lesions as revealed by examinations after death, and for the last five years I have received the general impression that a distinct and appreciable change is occurring in the relative percentages of the various types of the disease. This impression became so strong that I attempted to analyze a series of earlier cases and to compare them with other series of recent years. The results are shown in the accompanying tables.

In Table 1 the first column represents 250 complete post-mortem examinations from the records of the Pathologic Department of the Medical School of the University of Minnesota during the years 1908 to 1910 inclusive. These records were almost

entirely made by me or under my direction, and represent coroner's cases, cases from the City and University Hospitals, and a small proportion from private practice. All partial examinations and those on infants under six years were excluded, but with these exceptions the cases were listed seriatim. They are divided into four groups: (1) cases in which there were no demonstrable tuberculous lesions or pleural adhesions, (2) cases in which there was pleural fibrosis, but no lesions, (3) cases in which there were old healed foci, and (4) cases in which either chronic or acute, but still active, tuberculosis was present. The second column is a similar tabulation of 250 cases from the records of the same department, made by my successor, Dr. E. T. Bell, or under his supervision during the period between October 22, 1923, and April 21, 1924.

The results are striking. They show an increase of nearly 10 per cent in cases free from evidences of tuberculosis or adhesions, and a decrease of over 20 per cent in cases of active tuberculosis. In the third column are grouped 1,000 cases by percentages collected from the records of the Mayo Clinic, and representing post-mortem examinations performed by me or under my direction during the years 1922 and 1923. A still more striking decrease is seen in cases of active tuberculosis. The increase in cases of healed tuberculosis represents the results of extremely careful search for tiny lesions in each case. It is almost as significant as the cases in which there were no lesions, inasmuch as the healed foci represent increased resistance on the part of the host, and decreased virulence of the bacteria, betokening a losing fight for the latter.

To clarify this point further these three series were analyzed as to age incidence, and the results

TABLE 1

THE DECLINE OF TUBERCULOSIS AS EVIDENCED BY POST MORTEM STATISTICS

	1903-1910	1923-1924	1922-1923*
	250	250	1,000
	necropsies	necropsies	necropsies
	Per cent	Per cent	Per cent
No evidence	30.0	39.2	20.1
Adhesions	26.4	44.0	12.4
Healed tuberculosis ..	16.0	10.4	63.0
Active tuberculosis ..	27.6	6.4	4.5

* Mayo Clinic series.

TABLE 2

AGE INCIDENCE *

	1903-1910	1923-1924	1922-1923**
	250	250	1,000
	necropsies	necropsies	necropsies
	Per cent	Per cent	Per cent
Age, years	6 to 31 and 30 over	6 to 31 and 30 over	6 to 31 and 30 over
Adhesions ...	13.63	86.36	12.73
Healed tuberculosis	20.0	80.0	15.38
Active tuberculosis	20.29	79.71	31.25
			68.75
			22.22
			77.77

* Same cases as were used in Table 1.

** Mayo Clinic series.

given in Table 2. Each of the columns in Table 1 was divided into two age periods, the first six to thirty years, and the second thirty-one years and over. Of the 26.4 per cent of cases in the first column of Table 1 with adhesions, 20 per cent occurred in the first age group, and 80 per cent in the second. This is what one would expect, namely that adult life would be more largely represented in any list of general deaths. The most important point is revealed in the last two columns of Table 2. Here only 8.5 per cent of the patients with evidences of healed tuberculosis were under thirty years, and 91.4 per cent were over thirty. This means that the younger generations are acquiring a total immunity in far greater degree than the older generations. In fact, if healed lesions are found in a parent we have some grounds for assuring the son or daughter of a relatively increased immunity in themselves.

The figures given do not constitute conclusive proof. They are from a comparatively small series, and are not far enough separated in point of time. However, they are presented for what they may be worth, with the hope that more comprehensive and more detailed statistics may be gathered, and clearer evidence adduced concerning this important question.

Non-specific Protein Therapy—The mechanism involved in non-specific therapy concerns cell stimulation. Weichardt assumes that this involves all cells. Other researches indicate that certain cell groups may be more particularly concerned. On stimulation, the cell becomes more permeable. Antibodies, enzymes, fibrinogen, etc., leave the cell. Under certain conditions a rapid destruction of organisms may take place to an extent that may overwhelm the patient by sudden liberation of toxic bacterial products. The first phase of the reaction corresponds in many ways to a parasympathetic effect. Later a second phase follows during which the patient is improved. This phase may exist for a considerable time and is clinically apparent in the improvement of the patient. No cases are reported in the literature in which chronic urticaria has been so treated although many related conditions on evident or probable sensitization have been improved (hay-fever, asthma, migraine, epilepsy, intermittent hydrarthrosis). Great caution must be used in the employment of the more active substances such as typhoid vaccine, peptone and collargol. Very small doses of relatively mild activity (tuberculin, casein, turpentine) are much more suitable. This has been the experience in chronic arthritis. The dosage must be adjusted to suit the patient, care being taken to keep the dose at all times just below that which causes a focal reaction at the site of the lesion. (Jour. A. M. A., June 7, 1924, p. 1883.)

FOREIGN BODIES IN THE ESOPHAGUS AND AIR PASSAGES*

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On May 11, 1898, Dr. Algernon Coolidge, Jr., removed a portion of a tracheotomy tube from the right bronchus of a man by enlarging the tracheotomy wound, inserting a urethral speculum, and grasping the foreign body with alligator forceps under direct vision from a light reflected by an ordinary head mirror. This seems to be the first time that such a procedure was accomplished in this country. Since then many instances of the successful removal of foreign bodies from the food and air passages have been recorded in the literature, and, through the untiring efforts of Jackson, Mosher and many others,¹ peroral endoscopy has taken its place in the front ranks of technical surgical procedures. Because of the very technical nature of these cases, physicians have not given them much consideration, and it is my purpose to present some of the problems concerning this type of work.

Foreign bodies in the esophagus are less common than in the air passages. Coins, open safety pins, bones, partial or complete dentures, and fruit seeds of various types, may become lodged in the esophagus, but most small substances pass into the stomach without difficulty, and after entering the stomach almost all of them will have an uninterrupted passage through the gastro-intestinal tract. Often an open safety pin will pass through the entire alimentary tract of a very small child without producing the slightest discomfort. However, when one of these substances becomes impacted in the esophagus, it usually produces great discomfort, and occasionally death. At first there may be substernal discomfort with obstruction to the passage of solid food, and sometimes even of liquids. Pain on swallowing is commonly noted. If the patient strains very much to dislodge the foreign body, very early perforation may occur, with resulting mediastinitis and death.

Ulceration of the esophagus will result from the presence of almost any type of foreign body, and it is remarkable that the endoscopist rarely sees a

*Read before the Southern Minnesota Medical Association, Mankato, May 19, 1924.

foreign body that has been present in the esophagus for a long time. Stricture of the esophagus occurs rarely as a sequela even if there is considerable ulceration at the time the foreign body is removed.



Fig. 1 (A439921). An open safety pin in the esophagus that later passed into the stomach and through the alimentary tract without inconvenience to the patient.

The diagnosis of a foreign body in the esophagus can be made on the history, the direct *x-ray* findings in case the foreign body is opaque to the ray, the indirect *x-ray* findings in case the foreign body is non-opaque to the ray, and esophagoscopy. The history is quite important, and one should always bear in mind the fact that many psycho-neurotic patients have a feeling of a "lump in the throat," and will sometimes swallow a substance that produces a slight trauma in the throat and gives the sensation of a foreign body. Such patients should not be esophagoscoped unless absolutely necessary, because the trauma incident to an esophagoscopy has a tendency to increase the discomfort. In the case of foreign substances not opaque to the *x-ray*, the cause of obstruction in the esophagus may be determined by the ingestion of a thick barium mixture, or a capsule filled with barium or bismuth, and fluoroscopic examination. With the esophagoscope, the foreign body can be definitely located and its removal is usually accomplished easily.

Foreign bodies are lodged in the air passages rather often, owing to the fact that any substance

that enters the larynx will be aspirated, and unless coughed out, will remain in the trachea or one of the bronchi. Many foreign bodies are probably coughed out, but one is never justified in awaiting this method of removal. The practice of inverting the patient in an attempt to accomplish such a result should be discouraged, because a dislodged substance in the air passages may thus become impacted between the vocal chords, necessitating an immediate tracheotomy to prevent suffocation.

The symptoms of a foreign body in the air passages depend on its size, shape, composition, consistency and location. I shall not attempt to discuss the many problems involved in the diagnosis and localization of a foreign body that has been aspirated, but the combined efforts of the roentgenologist, internist, and bronchoscopist are often required.

Any child who develops an unexplained cough, with or without fever, should be suspected of harboring a foreign body in the air passages, and should have a most careful history and examination. Any patient, child or adult with a chronic pulmonary suppuration or pulmonary hemorrhage may have a foreign body in the air passages as the etiologic factor. In considering lung abscess and unilateral bronchiectasis, the presence of a foreign body should always be considered.



Fig. 2 (A455753). Ulceration caused by safety pin impacted in esophagus.

Many of the distressing results incident to the aspiration and swallowing of harmful foreign substances could be prevented by more careful oversight of children on the part of parents or attendants. This is particularly true with regard to the aspiration of peanut kernels. Small children

should not be allowed to eat nuts, particularly peanuts, as the symptoms caused by the inhalation of this type of foreign body are of a most fulminating character.

Although there are many cases of foreign bodies in the esophagus and air passages, there are hardly enough to permit the thorough training of many men for this type of work. Not more than two endoscopists to a community should be encouraged, and all cases should be referred to them so that they may perfect the technic that is so necessary

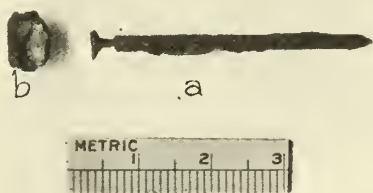


Fig. 3 (A457485). a. Nail removed from bronchus. Fever continued. b. Two weeks later, portion of oxidized metal coughed up by patient. Uneventful recovery.

in this exacting specialty. More than two specialists in this field divide the work so that none becomes expert, and the patient necessarily suffers.

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Exploiting the Cancer Sufferer.—The week of the annual session of the American Medical Association was chosen as a propitious time to resurrect two discredited cancer cures. A Philadelphia paper announced that the cause of cancer had been discovered and that a treatment had been evolved which was producing remarkable results. The publicity dealt with the alleged cancer serum of T. J. Glover of Toronto. This received some attention in 1921, but was not shown to be of value. The second "cancer cure" to be resurrected was that of Dr. Wm. F. Koch of Detroit. Koch's nostrum was brought to the attention of the newspapers of the country by one C. Everett Field. It received some attention in 1921, and was reported on unfavorably. The new publicity given to these two discredited "cures" is producing the usual effect. Sufferers from cancer both directly and through their physicians are frantically trying to learn whether there is any warrant for the claims so widely broadcast. (*Jour. A. M. A.*, June 21, 1924, p. 2054.)

ETIOLOGY OF INTESTINAL OBSTRUCTION *

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Intestinal obstruction is one of the most serious conditions with which the medical man is confronted, and in spite of the progress made in recent years, in medical science, it still presents many problems that are difficult to solve.

There are numerous factors that enter into the etiology of intestinal obstruction. There are a great many over which we have no control, but there are certain types of obstruction that occur following abdominal operations that can be eliminated if our patients are carefully prepared and we are careful in the handling of the viscera during the operation. There are some writers that believe that practically all cases of post-operative obstruction are preventable, but this view is undoubtedly too broad, for in the hands of the ablest operator, when the finest of technique is employed and the greatest of care is exercised in every respect, the fact still remains that post-operative intestinal obstruction does occasionally occur. Considering the number of abdominal sections that are performed it is striking to note the comparative rarity of post-operative ileus. It develops frequently in the most favorable cases, and at times one would least expect it, and therefore we must always be on the lookout for this complication as it is one condition above all others where every hour's delay is very costly to the patient.

I have divided the subject into four groups:

1. Cases in which the acute obstructive symptoms come on suddenly without previous symptoms;
2. Obstruction due to foreign bodies;
3. Obstruction due to tumors of the intestine, or growths outside the bowel;
4. Post-operative obstruction.

The first group I wish to consider includes the cases in which the acute obstructive symptoms come on suddenly without previous manifestations, as for example volvulus, intussusception, mesenteric thrombosis, strangulated hernia, or some form of obstruction due to a Meckel's diverticulum. De Quervain states that in most countries neither the student, nor surgeon, sees many instances of volvu-

*Presented in symposium on Intestinal Obstruction at St. Paul Clinic Week, January, 1924.

lus, but in Russia, especially in the Baltic states, it is the most frequent variety of obstruction brought into the hospital. Various explanations have been offered for this: the abundant dietary of potatoes or the greater length of the Russian intestine. These views are not accepted and it is much more likely that volvulus is due to a congenital or acquired abnormality in the mesentery, such as a long mesentery with a narrow attachment, thus affording the mesentery a more extensive movement. A volvulus may also be produced by the rotation of the ileum about its mesenteric border because of the lever action of a distended Meckel's diverticulum.

Intussusception may occur when an inverted diverticulum becomes invaginated into the ileum, forming a starting point for a progressive intussusception. An adherent Meckel's diverticulum may act the same as an adhesive band and cause strangulation of a loop or loops of intestine that might be caught beneath it.

When any of the external hernia, such as the inguinal, femoral, umbilical or ventral, become strangulated and the sac includes one or more loops of intestine, an acute ileus occurs. Forcible reduction of a hernia frequently leads to traumatism of the contents of the sac and adhesions occasionally result which may lead to the development of an obstruction. In this obvious type of hernia the solving of the problem is not as difficult as that presented by the strangulation of an internal hernia. Strangulation of an internal loop into a congenital peritoneal pouch is one of the rare causes of intestinal obstruction.

The principal forms of congenital internal hernia are: hernia at the foramen of Winslow, duodeno-jejunal hernia, hernia into the ileo-appendicular or retro-cecal pouch, and diaphragmatic hernia.

Embolism or thrombosis of the mesenteric vessels gives rise to a very fatal type of obstruction. It comes on suddenly and in its onset often resembles a paralytic ileus. The portion of bowel that has its circulation interfered with undergoes paralysis and this is rapidly followed by gangrene and peritonitis. Mesenteric embolism or thrombosis is apt to occur in cases suffering from valvular disease of the heart, or cases that have had an ulcerative endocarditis.

In the second group are the cases in which the occlusion of the bowel is due to a foreign body.

The most common causes of this type of ileus are gallstones and fecoliths. Obstruction due to true fecoliths is not common. Fecoliths are formed by the deposit of earthy salts around some foreign body matrix such as a fruit stone or a large vegetable fragment. This type of mass may be found in the colon or the ileum. Gallstone ileus is not common when one considers the frequency of obstruction due to other causes. The most common mode of communication is through the formation of a gallbladder-duodenal fistula. The stone being too large to pass out through the ducts, sets up an irritation which continues until a localized peritonitis results, which naturally causes adhesions to form with the adjacent structures, most commonly the duodenum. The continual pressure of the stone then leads to a fistulous opening into the first or second portion of the duodenum. If a stone is less than one inch in diameter it usually passes through the intestinal canal without causing obstruction. Even though the mass is large enough to cause a complete obstruction, there usually are intervals during the attack in which there is a cessation of the severe symptoms. These are due to the stone, through some means, being dislodged and to the fact that it makes some progress in advancement. The quiescent period lasts until the stone is again arrested in its progress and the strong peristaltic action begins an effort to expel the foreign body. This phenomenon may occur several times before the stone reaches its final goal, either of impaction or spontaneous expulsion. The occlusion of the intestine is not only due to the size of the stone but also to a spasm of the circular muscular fibers of the intestine. At autopsy in these cases decubital ulcers are found in the intestine, indicating the different points at which the progress of the stone was checked. When the obstruction is complete the distention of the bowel causes a perforation of one or more of these ulcers and peritonitis follows. Early peritonitis accompanies gallstone ileus more frequently than obstruction from some other cause and it undoubtedly plays an important rôle in the mortality.

The third group of cases includes those in which the obstruction is due to tumors of the bowel or to occlusion of the gut by pressure from a growth outside the bowel. Tumors are found more often in the colon than in the small intestine. They may cause obstruction by blocking the intestinal canal or by causing a kink in the bowel. Not infre-

quently they are the primary cause of a volvulus or intussusception. The benign tumors that occur in this region include adenoma, fibroma, lipoma and myoma, and the malignant tumors are carcinoma and sarcoma.

Carcinoma is the most common malignant tumor found in the intestinal tract and occurs more often in the colon than in the small intestine. Malignant tumors cause obstruction more frequently than the benign growths. Tuberculosis of the intestine may give rise to a chronic incomplete obstruction and at any time an acute complete ileus may develop.

Interference with the lumen of the intestine due to pressure from a tumor outside the bowel does not usually occur until the tumor is obvious or palpable. In this group may be mentioned the retroverted pregnant uterus, enlarged spleen, tumors of the uterus, ovaries or mesentery. The obstruction usually occurs in the rectum, the sigmoid flexure, or the colon above the sigmoid.

The fourth group includes cases of post-operative obstruction. In this group the type that is perhaps as puzzling as any other is that of paralytic ileus. This is due to a paralytic distention of the bowel caused by undigested food contained in the intestine or to traumatism of the intestines or mesentery during the operation. It is also often associated with an acute local or general peritonitis or an acute pancreatitis.

Post-operative adhesions resulting in bands that constrict the intestine or adhesions that form in such a way that the intestine becomes kinked, account for the majority of post-operative obstructions. If a patient has had an abdominal section and signs of acute intestinal obstruction present themselves, in the majority of cases, a band will be found to have caused the obstruction. The question of post-operative adhesions is a most important one and if some one could tell us how to absolutely prevent them it would be a great contribution to the science of surgery, but as far as I have been able to ascertain no satisfactory solution has as yet been advanced. These adhesions may form bands that are circumscribed and cut off the intestinal lumen or, frequently following the freeing of inflammatory adhesions, loops of intestine again become adherent and because of the inflammatory reaction and associated edema an obstruction may develop. This type of ileus may follow operations on the gallbladder, stomach, intestines, pelvic organs, or simple separation of adhesions due to

previous inflammatory diseases or operations. The surgeon has practically no control over the causative factor in this type of obstruction, but I wish to mention a few examples of post-operative ileus in which the surgeon does have the prevention in his own hands.

In doing a gastro-enterostomy an operator may not be careful in bringing up the loop of jejunum and in his manipulation this loop may become twisted, thus causing an interference with the intestinal lumen, and an obstruction results. Failure to suture the mesocolon to the stomach in doing a posterior gastro-enterostomy has often in the past been the cause of obstruction, as there is a tendency for the stomach to draw the jejunum upward through the opening in the mesocolon and strangulation of the loop of jejunum frequently follows. When performing an operation for suspension of the uterus in which the round ligaments are brought through the abdominal wall, great care should be exercised that no opening is left between the parietal peritoneum and that portion of the ligament between the internal ring and the point where the ligament is drawn into the abdominal wall. After the sutures have been placed, anchoring the ligaments to the fascia, one should again examine the ligament to be sure no space is left above the distal portion in the abdomen. Any opening at this point is a most favorable place for a loop or loops of intestine to enter and under various circumstances a strangulation may occur and an obstruction will result.

Not infrequently in dealing with the omentum it may be perforated in one or more places. It is obvious that such a condition invites trouble, as a loop or loops of intestine could very easily pass through one of these openings and one can readily conceive an intestinal obstruction as a result.

From these few examples it is evident that the surgeon must pay as much attention to the little things in surgery as he does the very evident major problems.

Intestinal obstruction is primarily a surgical condition, but since the successful therapeutic management of any disease is directly dependent upon the degree of familiarity with the etiological factors of the disease being treated, and since the internist is usually the first one that comes in contact with these cases, it behooves him as well as the surgeon to be thoroughly familiar with intestinal obstruction and its etiologic factors.

Van Buren, in a recent article on acute mechanical ileus, makes the following statement: "Subject to certain exceptions, it might be stated as a corollary that, if the case is really one of acute mechanical ileus, the longer the patient lives with it before operation the sooner he dies afterwards."

Dose of Thyroid for Children.—Thyroid effects are generally obtained by the administration of Dried Thyroid U. S. P. (Thyroideum Siccum). There is, however, no fixed dose of thyroid for children. The amount of dried thyroid to be administered must be determined in each case. A safe initial dose for a child three years of age would probably be 0.015 gm. of dried thyroids two or three times a day. The best way is to start with a small dose and to gradually increase it until either satisfactory improvement or symptoms of intolerance manifest themselves. As soon as the desired effects are obtained or symptoms of intolerance manifest themselves, the dosage must be reduced. (Jour. A. M. A., June 21, 1924, p. 2070.)

Therapeutic Lamps.—The Kromayer water-cooled mercury-quartz light and the Burdick and Hanovia mercury-quartz lights are considered sources of ultraviolet radiation of strong intensity, emitting a large quantity of long and short ultraviolet wave lengths. In contrast to this, carbon arc lamps, of which the ultra-sun lamp is an example, are used more particularly for the rays present similar to those in the spectrum of sunlight; namely, the invisible heat rays, the visible rays and the longer ultraviolet rays. The non-burning feature of the ultra-sun lamp is due to the practical absence or very weak intensity of the short ultraviolet rays which are the wave lengths that irritate and easily produce an erythema. The advertisers of the ultra-sun lamp stress the fact that the spectrum of their lamps is a continuous one, whereas the spectrum of the mercury-quartz light has gaps. No one has yet proved, however, that the presence of gaps in a spectrum is a drawback in the clinical use of that light. Furthermore, no one has proved that the burning or erythema-producing rays of the mercury-quartz lights are disadvantageous. It cannot be said that the carbon arc lamp is less valuable than the mercury quartz lamp for certain diseases. The exact indications for the different sources of light have not been worked out. (Jour. A. M. A., June 28, 1924, p. 2138.)

Vehicles for Prescriptions.—The following is a list of vehicles that can be used to prepare pleasant tasting mixtures: Aqueous Elixir of Glycyrrhiza N. F., Compound Elixir of Cardamom N. F., Compound Elixir of Almond N. F., Compound Elixir of Vanillin N. F., Glycerinated Elixir of Gentian N. F., Elixir of Anise N. F., Red Aromatic Elixir N. F., and Compound Syrup of Asarum N. F. The formulas of these preparations may be found in the Epitome of the U. S. Pharmacopeia and National Formulary, published by the American Medical Association. (Jour. A. M. A., June 28, 1924, p. 2138.)

SURGICAL DIFFERENTIAL DIAGNOSIS OF ACUTE INTESTINAL OBSTRUCTION*

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The course of acute intestinal obstruction is rapid; if unrelieved the mortality is 100 per cent. When it has reached the stage of easy recognition the case is often hopeless.

I believe that I speak for every surgeon when I say that we would infinitely rather meet in consultation the practitioner who, early in the case, contents himself with something having gone seriously wrong in the abdomen than the one who 48 hours later will give us an accurate description of what the operation (or post-mortem) will reveal.

The symptom complex of acute intestinal obstruction resembles very closely that of other conditions coming under the head of acute abdomen or abdominal crises. It is therefore not always easy to differentiate.

In attempting a differential diagnosis it is well to remember that pain resulting from a lesion of a viscus is felt, not in that viscus itself but is referred to the peripheral distribution of the spinal nerves arising from those segments of the cord with which that viscus is connected through its sympathetic nerve supply. So far as the alimentary canal is concerned, reflex pain from the stomach is referred to the region of the xiphoid cartilage and the umbilicus; that from the small intestine and appendix to the umbilical area, and that from the large intestine to the mid-hypogastric line. From the liver, gall-bladder, and bile ducts, pain is referred to the lower part of the epigastrium and also sometimes to the lower angle of the scapula.

All pain, therefore, that is felt in the early stages of an acute abdominal crisis is of this reflex character and is not localized to the situation of the viscus primarily at fault. Later, when the local inflammation has developed sufficiently to irritate the parietal peritoneum, the pain becomes localized at this point.

The number of conditions which might at some stage simulate intestinal obstruction are so numerous that it would be impossible in the time allotted to even hint at how they could be recognized either preoperative or post-mortem. The more common

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are general peritonitis, acute pancreatitis, acute appendicitis, acute perforation of gastric or duodenal ulcer, ruptured pyosalpinx, ruptured tubal pregnancy, torsion of pedicle of ovarian cyst, tabetic crises, thrombosis or embolus of the mesenteric vessels, gall-stone, renal and intestinal colic. The symptoms common to all are pain, shock and vomiting; all dependent on the same cause, namely, shock to the solar plexus. Since this group of symptoms appear in practically all acute abdominal crises they are of little value for differential diagnosis in the very early stage. "This initial stage of shock and accompanying symptoms, often transient, is usually followed by a period of reaction; a dangerous calm before a renewal of the storm—indeed, so dangerous that when prolonged by the indiscriminate administration of morphine it becomes a very pitfall in the way of correct diagnosis."

Approaching the subject in general, and from an angle somewhat different than the usual, one might classify the conditions from which intestinal obstruction must be differentiated and place them into groups, representing: I, Colics; II, Perforations; III, Inflammations; IV, Obstructions.

I. The colics are characterized by: (1) sudden onset of pain. (2) sudden cessation of pain, (3) tendency of the pain to recur. The pain in this group is usually referred to certain characteristic regions. In biliary colic it is felt in the epigastrium, radiating backwards to the angle of the right scapula and occasionally to the tip of the right shoulder. In renal colic the pain is felt, first in the loin, then shoots down to the groin, inner aspect of the thigh and testicle. Of marked diagnostic value in connection with the pain is increased frequency of micturition and blood in the urine. In intestinal colic pain is felt more or less all over the abdomen. Lead colic differs from other intestinal colics in that the pulse during the pain is retarded and the blue lines in the gums are present.

Tenderness of the abdomen is often present but in some cases, particularly intestinal colic, the pain is relieved by pressure. Muscular rigidity may occur in the colics but seldom is of the unyielding character found in the true involuntary rigidity. The patient is more restless than in other acute abdominal crises.

II. Perforations are characterized by: (1) sudden onset of pain, usually excruciating, (2) severity of the initial shock, (3) marked involuntary rigidity

from the very first, (4) there may be signs of free gas in the abdomen.

III. Inflammation.

1. In this group the onset is less sudden than in the conditions already considered, and general symptoms of malaise may precede the crises by a few days. The pain never reaches its greatest intensity in the first few moments.

2. There may be a rise of temperature in the early stage, wherein this group differs from the others mentioned. The presence or absence of rise of temperature should not, however, influence one too much in drawing conclusions and should certainly never be waited for to complete the diagnosis.

3. There is often fairly early local tenderness (sometimes first detected in the rectum as in salpingitis and pelvic appendicitis).

4. Muscular rigidity of the involuntary type, absent at first, appears when the parietal peritoneum becomes affected.

5. Swelling may later appear in the region of the appendix, gall-bladder, Fallopian tubes, etc. These signs should never be waited for in suspected intestinal obstructions.

IV. Obstructions are characterized chiefly by: (1) the persistence of vomiting, (2) the cessation of the passage of flatus, (3) progressive abdominal distention. Involuntary muscular rigidity is absent and the pain and tenderness are usually distributed more or less over the entire abdomen. As the condition progresses there is extreme distention, fecal vomiting, restlessness, pinched expression, rapid and thready pulse with profound collapse. When this stage has been reached it can be mistaken for only one other condition and that the usual termination of obstruction—general peritonitis.

If the case before us can be placed in one of the above named groups, the problem of diagnosis is at once simplified. When, however, the symptoms are indefinite or overlap as in obstruction, or perforation developing into peritonitis, the clinical differentiation is more difficult and can be arrived at only by carefully excluding all other conditions for which it might be mistaken.

Comparing the outstanding symptoms of the pathologic conditions which most commonly simulate acute intestinal obstruction we find as follows:

In *peritonitis* there is usually a history of some acute abdominal affection. In the early stage the pain is more marked and more continuous. The

distention is more general. The abdomen is immobile, noiseless and more tense. Visible peristalsis is absent, vomiting is less persistent. There is usually a rise in temperature and the increase in pulse rate a little more gradual.

Acute pancreatitis usually occurs in obese patients having a history of previous gall-bladder trouble. Pain is in the epigastric region and is very severe. Sudden profound collapse with early pinched expression and cyanosis are somewhat characteristic, but a definite diagnosis before operation is difficult.

Acute appendicitis may closely resemble obstruction in the earliest stage but usually within the safety period there is a rise of temperature, leucocytosis, localized pain and rigidity. Vomiting is not so constant. Where there is early rupture and consequent spreading peritonitis with toxemia a differential diagnosis may be difficult.

Acute perforation of gastric or duodenal ulcer. History of previous digestive trouble. The initial pain is more sudden, severe, prostrating, and constant. Shock, evidenced by pallor, cold sweat and collapse, is more marked. Pain, dullness, and spasm is usually more marked on the right side. The patient refuses to be moved. This latter with the tense board-like abdomen is characteristic.

Biliary and renal colic, except in the very early stage, offer no particular signs or symptoms which would make a differential diagnosis difficult. The spasm and characteristic pains referred to definite regions help to confirm the diagnosis.

Ruptured tubal pregnancy. The menstrual history with that of sharp, sudden, stabbing pain in the lower abdomen, together with faintness and pallor, should make the diagnosis comparatively easy; vaginal examination should never be neglected.

Tabetic crisis is often very difficult to differentiate from obstruction, because a paralytic ileus may exist as a result of the tabes. The Argyll-Robertson pupil, Rhomberg sign and the absence of kneejerk and other reflexes should put one on his guard.

Torsion of pedicle of ovarian cyst. With a history of tumor, or if pelvic examination reveals a mass in the pelvis or lower abdomen, the diagnosis is less difficult. Without the evidence of tumor and the presence of vomiting, distention and constipation—the latter often due to pain and spasm—a definite diagnosis from obstruction may be impossible before operation.

Ruptured pyosalpinx presents few symptoms common to intestinal obstruction except the first sudden pain and a gradually developing peritonitis.

Thrombosis or embolus of mesenteric vessels usually results in gangrene of a segment of the bowel with consequent cessation of passage of its contents through the part affected. The symptoms, therefore, are those of acute ileus and the demand for immediate surgical interference is the same as in acute obstruction from other causes.

Notwithstanding the improvement in surgical technic, the death rate from acute intestinal obstruction, even with operation, is still frightfully high. No surgeon denies the advisability of operating at the earliest possible moment. Yet the records of every hospital are replete with tragic stories, something as follows:

Patient admitted 6 P. M., history of pains in the abdomen, and nausea during the day. Pain, now, quite severe at times. Orders by doctor over telephone, morphine gr. $\frac{1}{4}$ per hypo. 8 P. M., patient more comfortable; vomited mucus and bile. The nurse's record the following morning: Patient comfortable the first part of night. Restless after 2 A. M. Slept only in naps. Vomited at 4, again at 5:30; light brownish color. Patient complains of some pain and tightness across abdomen. At 9 A. M. the doctor finds patient fairly comfortable *just now*. Some general distention, slight tenderness over abdomen, not localized; temperature 93.6, pulse 92. No bowel movement or flatus; face has tired expression, lips slightly dry, tongue moist. Laboratory report: leucocytes, 8,000; hemoglobin, 70 per cent. Differential, negative. Urine, highly colored. Sugar, negative; albumin, trace. Slight trace of indican. Microscopic, negative; diagnosis (?). Possible intestinal obstruction. Doctors orders: pituitrin, followed by enema; warm applications to abdomen; gastric lavage if vomiting continues.

Nurse reports by telephone at 4 P. M., fair results from enema with some flatus (when pinned down she admits that the fair bowel movement consists of highly colored water). Patient relieved after enema, but rather restless for last two hours with colicky pains, sometimes quite severe. Vomited at 11 and 3, stomach washed out; large quantities of brownish fluid with strong odor. Relieved for short time. Patient does not look so well, slightly delirious.

At 5:30 P. M. the doctor finds a little more distention, diffuse, but more marked in region of stomach, suggesting acute dilatation. Face rather pale with worn-out expression; lips more dry and a suggestion of dryness of tongue. Leucocytes, 8,500. Urine, scant; albumin and indican, positive. Temperature, 98; pulse, 100. Diagnosis still in doubt, but condition more indicative of obstruction. The doctor imparts his suspicion to the relatives and hints at surgical interference. They in turn implore him to first try everything else possible and at least wait till morning. Here we are weighed in the balance and too often found wanting; we yield, and in a last effort a purgative is ordered. At 2 A. M. the nurse reports that the patient is suffering from severe griping pains, distention more marked, and vomitus

dark brown, with foul odor; active delirium. The doctor hurries to the bedside, only to find the report of the nurse confirmed; by this time there is almost constant gulping of dark brown fluid with fecal odor, extreme distention, parched tongue, pinched expression, rapid and thready pulse, sub-normal temperature, cold sweat and extreme restlessness. The abdomen is immediately opened, only to find evidence of diffuse peritonitis, which the experienced surgeon at once recognizes as the beginning of the end.

A truly awful picture, and a terrible indictment against the profession, one to which most of us must plead guilty. We waited too long. We wanted to be sure, and while thus temporizing, the golden opportunity slipped away. Statistics complete the story.

We believe with Deaver, "that the reduction of the period between onset and operation is the prime factor. It cannot be too often repeated that during this period the essential point is *diagnosis* and not treatment. If treatment there must be at this time (and we are not blind to the fact that the physician feels the strong pressure of the patient and the family to be doing something), the physician should be sufficiently cognizant of the real issue and sufficiently resourceful not to be deluded or

forced into doing that which will endanger the certainty of the diagnosis or unfavorably influence the course of the disease.

"The danger of giving morphia before arriving at a diagnosis is well understood and it is only the densely ignorant and the incorrigible who persist in this misuse of narcotics. The purge belongs in the same category since it is even more deathly than the opiate."

The problem of acute intestinal obstruction can only be solved by early diagnosis and prompt surgical interference. It is vastly more important that we recognize an acute surgical condition in the abdomen than to wait for evidence upon which to base a definite diagnosis of intestinal obstruction.

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We do not know from whence ideas come, but the importance of the idea in medical research cannot be overestimated. From the nature of things, ideas do not come from prosperity, affluence and contentment, but rather from the blackness of despair, not in the bright lights of day nor the footlights glare, but rather in the quiet undisturbed hours of midnight, or early morning, when one can be alone to think. These are the grandest hours of all, when the imagination is allowed to run riot on the problem that blocks the progress of research, when the hewn stones of scientific fact are turned over and over, and fitted in so that the mosaic figure of truth, designed by mother nature long ago, be formed from the chaos.

In the medical literature of today, we have text books, scientific treatises, journals and magazines. One wonders if there is an end of knowledge. I fancy the pages that are covered with cancer literature, if spread out, would cover the state of Illinois. Yet, its solution is not at hand. I sometimes wonder if we are helped by too full a knowledge of medical literature. I must frankly confess that had I read all that was written on diabetes and known all of the conflicting views and theories I probably would never have tackled the problem.

The young man who devotes himself to medical research must familiarize himself with the first paragraph of Osler's "Alabama Student." It begins as follows:

"Chief among the hard sayings of the Gospel is the declaration, 'He that loveth father or mother or son or daughter more than Me is not worthy of Me.' Yet, the spirit that made possible its acceptance and which is

responsible for Christianity as it is—or rather, perhaps, as it was—is the same which in all ages has compelled men to follow ideals, even at the sacrifice of the near and dear ones at home."

The man who wishes to make a success in research work must be prepared to work. He must sever his connections with labor unions that restrict the hours of his labor. He must be prepared to live, move, and have his being in the laboratory, eating and sleeping beside his work, if need be. Matrimony and research have seldom gone together. Very many brilliant young men have been overwhelmed by domestic responsibilities and have been lost to research. Here again it is well to quote Osler, "Put your affections in cold storage. * * *"

It knows no protective tariff, no embargo, no boundary line, to prevent its free dissemination for the good of all. At present it is the common language and common spirit among the nations. May I make bold to hope that American and Canadian science, depending as they do upon the efforts of individual minds, may harmoniously progress hand in hand, until that day is reached when they shall have contributed the maximum of good to the greatest number, and have brought the people at large to realize that science is the search for truth, that a true knowledge of God's creation dispels superstition, fear and disease, brings happiness, peace and prosperity, and leads to that humility with which the informed intelligence recognizes the omnipotence of the Creator.—*F. G. Banting address at the dedication of the Illinois Research Hospital, Chicago. The Institution Quarterly, Vol. xv, No. 1.*

MEDICAL CONDITIONS SIMULATING INTESTINAL OBSTRUCTION *

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When we advance the statement that medical conditions can simulate intestinal obstruction we immediately admit that intestinal obstruction can either be overlooked or diagnosed where it is not found. This is proven frequently enough when one sees occasionally a patient operated for obstruction where the surgeon does not find any, and again another patient treated medically where a bowel obstruction is discovered only at the post-mortem table. Naturally the question arises: Why do these errors occur? Is it always due to a lack of training, experience or poor medical or surgical judgment? No, it cannot be, because some of the most eminent medical and surgical authorities have made these mistakes. So it is. Why then is it so? The answer is simple. Intestinal obstruction is not always easy to diagnose.

In general these errors in diagnosis may be attributed to, first, the absence or variation, in some cases, of such symptoms as pain, shock, collapse, vomiting, constipation, distention, tenderness, visible peristalsis or tumor, known as the classical symptoms of intestinal obstruction; second, to the simulation of like symptoms by strictly medical conditions. It is natural then for the sake of clearness to divide the discussion into three groups.

The first deals with definitely surgical conditions; the second considers conditions medical at first, which, however, eventually become surgical; the third group embraces strictly medical conditions simulating intestinal obstruction.

Since the first group of conditions has been covered comprehensively in the preceding papers it shall be dismissed here with mere mention.

The next group comprises both surgical and medical conditions. The absence or variations of symptoms is so marked at first that a diagnosis of an underlying surgical condition is impossible; hence the patient, while under constant observation, is temporarily treated medically. This variation of symptoms is usually dependent on the height and completeness of obstruction. High bowel obstruction most commonly gives extreme pain, shock and

vomiting; constipation and distention may appear later and visible peristalsis is usually absent. Low obstruction again generally produces slowly distention and constipation, pain is less severe and the shock may be very slight, while vomiting is either absent or occurs very late in the disease. The next factor adding to the confusion or variation of symptoms is completeness or incompleteness of bowel obstruction. In intussusception and mesenteric thrombosis or embolism incomplete obstruction may obtain and symptoms like constipation and distention may be absent or replaced by tenesmus and bloody stools. Thus simulation by Hanoch's purpura, cirrhosis of the liver, enteritis and colitis is possible. It has been demonstrated, however, that most of these cases suffer from either partial or chronic intestinal obstruction. Of course, these cases are surgical, but the operation is delayed because in the beginning a definite diagnosis of the underlying surgical condition cannot be established. To this group one may add also a few medical conditions which, failing to respond to medical treatment, demand surgical intervention. Such conditions are produced either by mechanical agents in the bowel or by functional paralysis of the intestine. The most frequent mechanical obstructions are due to fecal impaction, parasitic infestation and foreign bodies. Functional paralysis of the bowel may follow a severe injury to the testicle, ovary or hernial sac. It also may occur after a hemorrhoidal operation, abdominal paracentesis for large quantities of fluid, after passage of a renal and biliary calculus, and even rarely following operations not on abdominal viscera.

To the third group simulating intestinal obstruction belong strictly medical conditions demanding only medical treatment. The onset practically of any violently acute contagious or infectious disease must be considered. The onset occasionally of such diseases as Hanoch's purpura, enteritis, colitis, typhoid fever, and cholera may simulate intestinal obstruction. A severe pleurisy or pneumonia may produce, by its toxic products acting on the nervous mechanism of the bowel, a paralytic ileus. This usually is temporary and can nearly always be relieved by medical measures. Mannaberg and Osler, however, both record cases where an operation was necessary to relieve the paralytic obstruction. Uremia and poisoning from arsenic and lead may produce symptoms simulating bowel obstruction. One,

*Presented in symposium on Intestinal Obstruction at St. Paul Clinic Week, January, 1924.

of course, is endogenous, the other two exogenous in origin. A urinalysis will usually suffice to suggest further study of the case. A renal function and blood chemistry test with a blood pressure study will be confirmatory of kidney insufficiency. The occupation, lead line, and stippling of red blood cells are important factors in making a diagnosis of lead poisoning. Injuries or irritations to the nervous system, whether organic or functional, can also imitate symptoms and signs of ileus. One must, therefore, rule out any local injury to the peritoneum or omentum. Distant disease, again, e. g., in the thorax, may so irritate the sensory nerve segment that seemingly alarming symptoms are present mostly in the abdomen. The most frequent confusing of the spinal diseases is tabes dorsalis. An Argyll-Robinson pupil with absence of knee jerks usually makes one consider syphilis. Sometimes so-called functional neurosis, such as hysteria, adds to our confusion. A careful familial and personal history together with a superabundant and frequently dissociated number of symptoms places one at least on guard for possible neurosis.

CONCLUSIONS

1. Intestinal obstruction is not always easy to diagnose.

2. The examiner ought to group the possibilities into one of the following groups:

(a) Surgical and operate at once.

(b) Medical at first, but later surgical due either to an insufficient or seemingly incompatible number of findings to form in the beginning a surgical opinion, or to a definitely medical condition which, failing to respond to medical measures, must receive surgical intervention. The medical treatment in this group ought not to continue longer than twenty-four hours, because the surgical mortality bears a direct ratio to the delay of the operation. It is in this group that all medical and surgical authors agree with the statement, "when in doubt operate."

(c) The third group is strictly medical and yet when authors like Mannaberg and Osler each report seeing pneumonia, by its toxicity, producing a paralytic ileus which demanded surgical intervention, we can then appreciate properly how medical conditions can simulate intestinal obstruction.

THE CLASSIFICATION AND TREATMENT OF HEMORRHOIDS*

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In the brief time assigned to this paper it is impossible to discuss all of the details and minor considerations incident to the many methods devised for the treatment of hemorrhoids. I merely hope to outline enough of the more important points to arouse some thought in this direction. The chief demand of the patient is that he be given a permanent cure and that he suffer as little pain as possible. In fact, pain is usually one of the chief considerations to him. It is quite possible to give him a permanent cure with practically no pain if we keep certain anatomical relations in mind and act accordingly. It will be recalled that almost all of the nerves of sensation of this region lie within the anal canal and that the rectum itself is almost insensible. It is this one point which enables us to care for these cases practically without pain. A minimum of trauma to the anal canal means a minimum of pain for the patient.

The most simple classification of hemorrhoids which I know is to divide them into two distinct varieties. First, the internal, which lie above the junction of the anal canal and the rectum and are covered by the velvety appearing, mucous-secreting, columnar type of epithelium. Second, the external variety which lie at the outer orifice of the anal canal, are covered by true skin and appear as a bluish swelling when the patient strains and the varicosities composing it are engorged with blood. At least half of the patients presenting themselves do not show either of these distinct types of lesion. More often than not a varicosity forming an internal hemorrhoid will extend downward into the anal canal thus forming an interno-anal hemorrhoid, or the varicosity of an external hemorrhoid may extend upward into the anal canal, thus forming an externo-anal hemorrhoid. Not infrequently the varicosity will extend from within the rectum downward, completely through the anal canal, joining with an external hemorrhoid below to form an interno-ano-external variety. This may seem to be an unnecessarily detailed description of a condition

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so common as piles, but it is the recognition of these distinctions that enables us to cure them with little pain. Only too many cases are operated on the catch-as-catch-can principle, anything that is protruding being seized and burned or cut off without regard to its relation to the sensory nerve supply.

Whatever method may be decided upon it must be remembered that the anal and external varicosities must be considered as a separate condition from those inside the rectum. I believe that the two best methods of dealing with the anal and external varicosities are as follows: First, the method of excision, in which case the redundant portion of the overlying skin and mucous membrane is removed by sharp dissection and through this opening the varicosities carefully dissected out. The second method is to make a buttonhole incision at the base of the pile and inserting the blades of a pair of scissors through this opening macerate the varicosity, thoroughly destroying the vessels. This is done entirely subcutaneously and with care the skin is not cut except at the point of entrance. This leaves the anal canal intact and there being no raw surfaces the bowel movements are painless. Theoretically this method may not be quite as accurate as the first, but it is less painful and with experience the results are good. In connection with this type of hemorrhoid it is well to add that there are no vessels in the anal canal that it is necessary to ligate. This is a most important consideration for one ligation tied on anal tissue will cause the patient severe and prolonged pain. Only under most unusual circumstances should any ligatures or stitches be taken in this region and cauterization should never be done. If either ligatures or stitches are used pain is certain to result and should be expected.

The anal and external varicosities having been dealt with, the next consideration is the treatment of the internal hemorrhoids or true rectal varicosities which remain. Personally, I usually eliminate these either by the injection of a 5 per cent solution of quinine urea hydrochloride or by ligation; but I also wish to mention other methods and to point out their advantages or disadvantages. In many cases with the internal hemorrhoids there is a greater or less prolapse of the rectal mucous membrane and in choosing a method of cure this must be taken into consideration.

The clamp and cautery method is one of much repute in the Northwest. I can only attribute this

to the fact that until very recently it was the usual operation done at the Mayo Clinic. Personally, I have never seen much excuse for this method. If the cauterization is confined to the rectum alone it is not painful, but usually some anal tissue is also included in the burn and then the patient's agony begins. As a matter of fact many who now profess to favor the clamp and cautery do not really do the clamp and cautery operation. They first dissect up the hemorrhoid and then applying the clamp around the shred of tissue left at its base announce that they have done a clamp and cautery operation. One reason advanced in favor of this method is that it is extremely simple and anyone can do it. If it is simply a question of seizing any protruding or bulging tissue with the pile clamp and then burning it off it is "simple." After the pain has subsided the resulting scar may produce relief if it does not produce a stricture. However, knowing the pain caused by a burn and the cicatrix and contractions resulting from it, I cannot feel that it is a very safe procedure to turn anyone but an expert loose in the rectum, with a pile clamp and a hot soldering iron. I have seen only one stricture following a ligation operation and I have seen many following clamp and cautery. Aside from the pain and granting that in the hands of an expert there is no danger of stricture, there is still another more important reason why to me this method is not good. I do not believe that it is humanly possible to do an accurate removal of all the varicose veins with instruments as crude and clumsy as the clamp and cautery. Some varicosities are almost certain to be left and some healthy tissue sacrificed. Examinations of these cases after operation will prove this point in many instances.

What is really the result when the clamp and cautery is done and why is the percentage of apparent cures fairly high? In the first place several lines of cauterization are made along the long axis of the bowel. The scar produced by this binds the mucous membrane to the muscular coat of the bowel as in the case of linear cauterization for prolapse. This, of course, prevents protrusion and relieves the patient of this symptom. However, it does not prove that no piles are present; it only proves that they no longer protrude. If the rectum is inspected through a speculum large varicosities will often be seen clinging to one or both sides of these lines of scar, tethered in place like a toy balloon on the end of a stick. The scar prevents

their protrusion but they are there and likely to cause trouble later.

As has been previously stated, prolapse of the mucous membrane is present with many cases of hemorrhoids. As a matter of fact, many cases are treated as hemorrhoids, where the chief trouble present is really a prolapsus. In these cases a few varicosities appear to protrude through the anus and so hemorrhoids are diagnosed, but if more careful examination is made it will be seen that these varicosities are small. The major part of the protrusion is really a prolapsus of the mucous membrane which, in sliding down, has carried a few hemorrhoidal vessels with it. I would say off hand that fifty per cent of the persons complaining of hemorrhoids have this condition. Clamp and cautery does relieve this type of prolapse. If these cases are examined after operation all of the piles appear to have been removed, the reason being that there were really no piles present in the first place. If the cases which actually have large internal hemorrhoids were considered I believe practically all of them would show a considerable amount of hemorrhoidal tissue left after the clamp and cautery operation. Either this or a stricture would be present.

Another method of dealing with internal hemorrhoids is advanced by Dr. Murray of Duluth, who uses it on both internal and external type. This, as was previously described, is to make a button-hole incision at the base of the pile, then with scissors to destroy subcutaneously the hemorrhoidal vessels. This is a useful method, but requires more experience to do well than open dissection with ligation. The inexperienced are likely not to destroy the vessels thoroughly enough. It is less painful than complete excision. In my opinion, it should not be used in cases associated with prolapse of the mucous membrane, which, as was previously stated, is quite common.

Method of injection.—In this case I use the injection of a 5 per cent quinine urea hydrochloride solution, based on the original work of Dr. Terrill of Richmond, Virginia. These injections are made at weekly intervals, using from 0.5 to 2 c.c. of solution. More than one injection to a hemorrhoid may be necessary. These injections are not very painful and have the advantage that the patient can work every day. The time of cure is usually from six to eight weeks, but this period can be shortened to two or three weeks if the patient can be quiet.

This method may be employed even where there is some prolapse of the mucous membrane, for if a few injections of the fluid are made between the mucous and muscular coats as well as into the hemorrhoids, the reaction produced will cause scar tissue to form which binds the mucous and muscular coats together, thus curing the prolapse. I have previously described this procedure in a paper presented before the Southern Minnesota Medical Society. The danger of embolus, liver abscess, etc., is frequently mentioned as an argument against the injection method. I can only say that it never as yet has occurred in my experience, nor do I believe there is much danger if ordinary antiseptic precautions are observed. That they may occur if one is careless of his technique is quite possible. We all know of occasional deaths and other serious complications following operations for hemorrhoids, whether done by clamp and cautery, ligation or other methods. It may be possible that eventually some misfortune may attend a case where I have employed the injection method. Nevertheless I feel that the method is at least as safe as any other. Electrolysis may be used in the same cases where injection can be done and the same principles apply.

Ligation.—Where operative procedure is necessary or decided upon I feel that this is the method of choice. My preference for this is that all pathological tissues may be accurately dissected out and removed as cannot be done with the clamp and cautery. This applies whether simply hemorrhoids or hemorrhoids and prolapsus exist. The external, anal and internal are all done with one dissection and it is relatively painless. There are two variations of the method which I think best. The first is to bring the internal hemorrhoid into view; then with a curved needle take a stitch at its upper pole. Tying this, the vessel supplying the hemorrhoid is cut off, and the procedure rendered almost bloodless. The ends of the ligature are left hanging and the lowermost part of the hemorrhoid seized and dissected upwards almost to the ligature and a tie then made around the stump. This method has the advantage of being almost bloodless, but the disadvantage of stitching through the rectum. This probably increases the danger of infection and often delays the separation of the ligature. The second method is to start the dissection at the lowermost part of the varicosity, carry it well up into the

rectum and then ligate. This method requires no stitch, but it is more bloody and unless the ligature is tied very close to the mucosa it may leave a little polyp-like tab of mucous membrane when the ligature separates. I usually leave the ligatures long, for by so doing they act to a certain extent as a wick, and, what is more important, it can be told when they have separated. If they are unusually slow, gentle traction each day will hasten their separation.

This paper is entirely a personal one and the synopsis of the various methods represents only my own convictions. I hope it will arouse interest in some of those present to continue to investigate problems in this connection. While we may not always agree, it is only by exchange of ideas that we progress.

RESTRICTIONS IN LICENSURE EXAMINATIONS TO THINGS THAT ARE SIGNIFICANT

Attention is again directed to the subject discussed by Dean Edsall in an article recently published in the *Bulletin*.

This article emphasizes particularly that state boards like medical schools are more concerned with the increasing of requirements, mainly as to the simple acquisition of facts rather than an intelligent contemplation of these facts, or the comprehension of the competent use of them.

There is an increasing tendency because of tradition and custom, both in teaching and licensure examination, to retain certain knowledge and facts that are obsolete and have long ceased to be of value.

There is no question that the medical curriculum, as well as qualifying examinations, have become extremely rigid in this country. It has been well said that there is less intellectual freedom in the medical course than in any other form of professional education. Individuality is submerged and there is little opportunity for developing individual responsibility.

It is time also that the quality of knowledge should take precedence over quantity, and this applies particularly to licensure examinations. This appeal from Dr. Edsall to examine only in the significant and important things is therefore very timely.

The state boards responded promptly to the general request that examination in materia medica, pharmacology and therapeutics be limited to the more important drugs. Why cannot this same principle be applied to the other subjects?

It is earnestly hoped that the Federation will offer its fullest co-operation so that this most desirable change in examination methods can be brought about.—*Federation Bulletin, Vol. X, No. 5.*

ETHYLENE ANESTHESIA: REPORT ON USE AT ANCKER HOSPITAL

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Inspired by the results of the experimental and clinical work of A. B. Luckhardt and J. B. Carter of Chicago, and of W. E. Brown, of Toronto, pioneers in the recent development of ethylene anesthesia, we decided recently to give ethylene anesthesia a thorough trial at this hospital to determine whether or not it had a practical application in a hospital of this type, considered from both a clinical and financial standpoint. Since our first ethylene anesthetic we have used it to the exclusion of all other general anesthesia, except when several operations were scheduled simultaneously so that the ethylene apparatus was not available for all. We have made the following observations on 300 cases of ethylene anesthesia through a wide range in the field of minor and major surgery.

We desire here to express our indebtedness to Miss T. Zita Costello, R.N., anesthetist, and Dr. Carl Stomberg for their aid in the preparation of this report.

An analysis shows that of the three hundred cases, 194 were major surgical procedures, which included 12 cholecystectomies, 20 salpingectomies, 43 appendectomies (of which 27 included general peritonitis), 22 herniotomies, 8 hysterectomies, 3 thyroidectomies, 5 ectopic pregnancies, 3 thoracoplasties and 2 gastro-enterostomies. The minor surgical procedures were chiefly perineal repairs, curettements, abscesses, reduction of fractures, and the like.

The age limits varied from an infant of two months, with a sub-periosteal abscess (mastoid), to an adult male of seventy-seven years, who was anesthetized for implantation of radium needles. Fourteen cases were sixty years or over and thirteen cases were six years or younger. For both age extremes, ethylene anesthesia had no bad effects, but rather seemed an ideal anesthetic because of the ease and rapidity of induction, the quiet, undisturbed respiration, the regularity of the pulse during the anesthesia and the absence of any untoward post-operative symptoms such as shock, pulmonary involvement or severe vomiting. We have experienced nothing that would indicate that ethylene

anesthesia is anything but the safest and most desirable anesthesia at present available for the extreme age limits.

For the 300 cases, 208 hours of ethylene-oxygen gas were used, giving an average of forty-three minutes per case, with seven cases consuming more than two hours. In 40 of these cases, ether was used at some stage of the operation, sometimes to aid relaxation or during induction in cases where the patient was unduly excitable or unyielding.

The induction period for ethylene has averaged four and one-half minutes. A few cases required up to eight and ten minutes for induction, but when a longer period than this was consumed ether vapor was found to be necessary, as in two cases of general peritonitis. In practically all cases the induction has been quiet and free from struggling and talking. In some alcoholics and in some cases of severe peritoneal involvement, the induction was modified very much, making it necessary to add ether vapor. However, in many such cases, the patient was very slow to yield even with ether as an adjunct and this was generally true of all cases that did not yield promptly to ethylene.

We have found in the great majority of cases the relaxation has been very satisfactory for practically all major procedures. The relaxation is definitely more complete than with nitrous oxide, and less than with ether in some cases. In 40 of our cases we have used ether in some part of the operation and this has been necessary either during the induction or during severe peritoneal or mesentery manipulation. The ether used has varied from a few minutes up to fifteen. These cases were often relaxed only with great difficulty and sometimes unsatisfactorily, even when ether was added. We have been led to believe that the commercial ethylene varies or that certain impurities may be present in different cylinders because twice, upon using new tanks of ethylene, the relaxation was very poor in all cases using that gas, and upon replacing the cylinders for others no further trouble was experienced.

The recovery from the anesthetic has been uniformly prompt in all cases, even when ether has been used. The patient is oriented in one to two minutes and the length of the anesthesia does not seem to affect this prompt recovery. Just before awakening there is a vomiting reflex present which not infrequently causes the patient to regurgitate usually a mucous material. Sometimes there is

definite vomiting while the patient is still on the operating table, but usually this does not occur after the patient has awakened from the anesthetic.

During the anesthesia the patient's skin remains remarkably dry, noticeable perspiration having been present in less than ten cases, and usually this has appeared during a strenuous induction period, as occurs in most alcoholics. The color remains normal, and in no case has there been cyanosis, regardless of how hard the anesthesia has been pushed, providing the minimum oxygen percentage necessary for respiration has been given. The sleep is very quiet, the respirations uniformly deep and regular, simulating exactly a normal sleep. Record of the pulse and respirations before, during, and after the operation have been kept as a part of the anesthesia record. The pulse and respirations before operation are those charted on the ward just before the patient is sent to the operating room. During the operation they are recorded about every five minutes, and following the operation they are again recorded as soon as the patient has awakened, before he leaves the operating room. In analyzing these records, we find the respiration rate was increased in 132 cases, an average of 3.8 respirations per minute, in all cases, and for those that had ethylene only (no ether), a rise of 2.8 respirations per minute. The respirations were decreased in 47 cases, an average of 2.8 respirations per minute or 2.5 for those patients who had no ether. The remaining 121 cases showed no respiratory change. The pulse in 150 cases was increased an average of 7.8 beats per minute or 5.7 beats in those cases where ethylene alone (no ether) was used. It was decreased 5.3 beats per minute in 97 cases, and for those cases that had ethylene only, a decrease of 5 beats per minute was shown, also a negligible difference. The remaining 53 cases showed no pulse changes. Therefore, we find that in ethylene anesthesia, including cases where a small amount of ether has been used, that there is a slight decrease or no change in the respiratory rate in 75 per cent of the cases, and in the other 25 per cent, the increase is only three to four respirations per minute; that the pulse remains the same or is decreased in 50 per cent of the cases and that in the other 50 per cent there is an increase of seven to eight beats per minute. When we exclude the patients who have had ether we find that there is practically no difference, the reason being that very little ether was used in any case.

We have been unable to take blood-pressure readings on all cases but those that have been taken have shown no appreciable change during or after the anesthetic. On a number of patients we have taken the clotting time before and during the anesthesia and here also we have not been able to demonstrate any change.

Following an operation in a patient who has not had premedication of morphine, we find that the patient complains of pain very soon and that morphine is usually necessary within fifteen to thirty minutes after return from the operating room. Patients who have had morphine previous to the operation do not complain of pain nearly as soon and often can go several hours before medication is necessary, but other conditions being equal, it is necessary to give medication for relief of pain considerably earlier in ethylene cases than in ether cases. Morphine premedication does not seem to have any effect on the course or ease of administration of the ethylene anesthesia.

The results from ethylene anesthesia from the standpoint of post-operative nausea and vomiting have, indeed, been very gratifying and we are likely to speak so favorably as to seem overenthusiastic. However, in comparing the period of our use of ethylene with a like period just prior to its use here, when ether and nitrous oxide were our anesthetics, we note a very appreciable lack of post-operative nausea and vomiting and an unusually uneventful convalescence of cases on all surgical services. Examination of records shows that there has been some vomiting after return from the operating room in 61 cases, sometimes only once and often very slight, and in only a few cases prolonged and severe. Twelve of these cases had ether during some part of the anesthetic. These cases include 6 cholecystectomies with appendectomies, 8 appendectomies, 5 salpingectomies, 3 ectopic pregnancies, 2 thyroidectomies, 3 hysterectomies, 3 curettages, 3 herniotomies, 3 pelvic abscesses with general peritonitis, 1 thoracoplasty, 1 nephrectomy and 1 orchietomy. The severest and most prolonged vomiting has been noted in cases of severe shock, as in acute appendicitis with general peritonitis and as in one case of ectopic pregnancy, where the bleeding had been excessive and the patient was in considerable shock. In the gallbladder cases, the vomiting was most frequently present (six cases out of twelve), but not prolonged or excessive. Several patients had a definite psychic element

present that unquestionably modified the post-operative course. These 61 cases do not include the cases that vomited while still on the operating table before awakening fully from the anesthetic. This has happened more frequently than the vomiting after leaving the operating room. This vomiting is probably due to the return of reflexes as the patient is awakening, as most commonly it consists of only a few contractions or attempts at vomiting, often producing only a bile-stained mucoid emesis. Very occasionally, this vomiting may be considerable in amount.

It is interesting to note that there has been very definite indication of inequality of the commercial ethylene, as stated before. We had two tanks at some considerable interval apart that seemed to be different from the usual ethylene in that the incidence of vomiting would be present successively and persistently until the cylinder being used was exchanged for a new one, when its occurrence would drop immediately to normal frequency. We have been unable to attribute the coincident difficulty of fully anesthetizing patients and the increased vomiting to anything but impurities in the ethylene. In the 300 cases there were less than 10 cases of severe vomiting, regardless of the condition of the patient, and the stomach lavage has been necessary but 4 or 5 times. Including all cases, vomiting either mild or severe has been present in less than 25 per cent of the cases.

Gas pains have been the source of very little complaint; certainly, very definitely less than for ether anesthetics and when present have usually been in cases of severe peritoneal irritation.

Food can be more freely given than after ether anesthesia. Liquids have been taken very freely in most cases on the day of operation and often broths or even milk drinks have been tolerated, depending, of course, upon the length of the anesthesia and the nature of the surgical procedure. On the first and second post-operative day soft diet has been well taken where the operative condition has not contraindicated.

The general convalescence has unquestionably been far more uneventful and definitely more rapid in the ethylene cases and the general condition of the patient, especially the first post-operative days, is surely better than with other general anesthetics. Undoubtedly, this is a factor in speeding up the convalescence and a patient's stay in the hospital.

Of the cases of special interest, we wish to men-

tion that of a patient operated for acute appendicitis, who had a history of angina pectoris. This patient was anesthetized with ethylene at 9:45 A. M. and in twenty minutes had an attack in which the pulse became slower and very weak, the extremities became cold, the body was cold, and covered with excessive perspiration, and the respiration rate decreased. The operation was stopped and the patient given oxygen immediately, coming out of the anesthesia very promptly, but apparently in considerable pain. In about five minutes the attack had subsided and the patient was re-anesthetized and the operation was finished uneventfully. It is a question, of course, how well the patient would have fared with an anesthesia less easily controlled than ethylene, and whether the operation could also have been finished without further disturbance.

In the case of a boy, aged 7, we had the coincidence of an acute appendicitis (ruptured) and a lobar pneumonia. The patient was very sick, but surgery was necessary, and the appendix was removed under ethylene anesthesia. The boy recovered in the usual time of a drainage case, with no further complications and the pulmonary condition apparently in no way affected by the anesthesia.

Two cases of thoracoplasty on tuberculous patients have been successfully performed under ethylene anesthesia in which the patients recovered promptly from the surgical procedure, evidently suffering very little shock and giving no evidence of irritation or disturbance to the pulmonary condition. In one case, the first stage was done before ethylene had been instituted at this hospital, so that local and nitrous oxide anesthesia was used. The anesthesia was quite unsatisfactory, the patient having considerable pain and suffering definite shock. With the second stage, in which portions of a larger number of ribs were removed and the procedure generally was more radical, we had an uneventful ethylene anesthesia, with practically no post-operative shock and a very rapid recovery.

The average cost of ethylene-oxygen anesthesia, as it is given routinely, has been about \$2.40 to \$3.00 per hour, with the ethylene alone averaging about \$2.00 to \$2.40 per hour. It is evident that ethylene costs definitely much less than nitrous oxide and about that same proportion more than ether. However, in considering the advantages of ethylene over the other general anesthetics, especially from the standpoint of the comfort and well-being of the patient, besides the saving in shorter

hospitalization, the extra cost is well compensated for.

SUMMARY

1. All ages seem to tolerate ethylene anesthesia very well, and it is, apparently, an ideal anesthetic for both the age extremes.

2. Induction has been quiet and rapid, except in some cases of alcoholics and general peritonitis.

3. The relaxation has been usually sufficient for all surgical procedures. In cases where it is not sufficient with ethylene-oxygen alone, ether vapor, which is easily administered in conjunction with the ethylene-oxygen apparatus in small amounts, gives the desired relaxation, without affecting the post-operative results of ethylene anesthesia.

4. The recovery from the anesthesia is uniformly prompt. It is not infrequently accompanied by a momentary return of the vomiting reflex.

5. Seventy-five per cent of cases show a slight decrease or no change in the respiratory rate and the other 25 per cent have a rise of 3 to 4 respirations per minute. Fifty per cent of the cases show a slight decrease or no change in the pulse rate and the other 50 per cent show only an increase of seven to eight beats per minute.

6. There has been no noticeable change in blood pressure either during or after the anesthesia; nor has the blood clotting time been changed from normal during the anesthesia.

7. Medication for relief of pain after operation is necessary sooner after ethylene cases than for ether.

8. In our series of cases, which included both minor and major surgery, the vomiting following operations has been present in about 25 per cent of cases; very rarely is it severe or prolonged, and usually occurring but one or two times. Slight vomiting is quite frequently present in the operating room, just before the patient awakens. Impurities in the commercial ethylene undoubtedly are an important causative factor for some post-operative vomiting.

9. Pulmonary conditions apparently are not affected by the ethylene anesthesia; at least it can be given with relatively very little danger.

10. The cost of ethylene-oxygen anesthesia is considerably less than for nitrous oxide, and though more costly than ether, its many advantages definitely offset this increased cost.

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VOL. VII AUGUST, 1924 No. 8

EDITORIAL

Ethylene Anesthesia

The gas ethylene (C_2H_4) is one of the new general anesthetics. It was introduced by Luckhardt and Carter, and was first used in the Presbyterian Hospital, Chicago. It is one of the hydrocarbon gases which is prepared by removing one molecule of water from grain alcohol. It may be looked on as an anesthetic occupying an intermediate place between nitrous oxide and ether, and has certain very distinct advantages.

Ethylene may be given through the ordinary gas inhaler. About 20 per cent of oxygen must be combined with it. It mixes satisfactorily with ether, and through the ordinary inhaler, from 1 to 25 per cent of ether vapor may be given at any time. Anesthesia may be produced by ethylene within two or three minutes, and with very little discomfort to the patient; very seldom is any excitement or sense of suffocation experienced. When ethylene is properly given very little change in the pulse or respiration is noticed. Patients perspire but little and awaken quickly after the anesthetic is withdrawn. It is borne well by the lungs and

there is little tendency toward accumulation of mucus in the respiratory tract or throat.

The relaxation produced is sufficient for all ordinary operations outside the abdomen, but in order to obtain the proper relaxation in intra-abdominal operations it is often necessary to use in conjunction with ethylene other substances which tend to increase relaxation. One-sixth of a grain of morphin administered half an hour before an operation tends to increase the efficiency of the anesthetic, and in abdominal work greater relaxation may be produced by the injection of 0.5 per cent novocain solution in the subperitoneal tissues after the incision has been made through the skin, aponeurosis and muscles. In all abdominal operations the narrow margin of anesthesia produced by ethylene may be broadened, and relaxation increased by administering also a small amount of ether (1 to 8 per cent). There is probably as much vomiting following ethylene anesthesia as following ether, but the reflexes are quickly regained after the anesthetic is discontinued, and patients are usually well able to take care of any material vomited.

In obstetrical work a combination of nitrous oxid and ethylene has proved very satisfactory. As an adjunct to local anesthesia during certain periods when it is necessary to make traction, and so forth, ethylene is also of great advantage on account of the rapidity with which anesthesia is produced and the ease with which patients awaken after it is discontinued.

Ethylene has the disadvantage of being a very inflammable gas, and cannot be safely given while a thermocautery of any sort is being used. This difficulty may be overcome by discontinuing the use of ethylene gas and supplanting ether for a few minutes before and during the time the cautery is to be used.

Ethylene given in lethal doses to animals kills by paralyzing respiration, but cardiac failure is late in developing, and after respiratory failure has occurred animals may be resuscitated by inducing artificial respiration.

Surgeons who work with ethylene as an anesthetic, especially in the abdominal cavity, should develop a technic similar to that used in operating under local anesthesia; that is, gentle manipulation with as little traction as possible on the abdominal walls or abdominal organs.

For many years ether has occupied a prominent

place among anesthetics; it is so safe and produces such excellent relaxation that it will be difficult to displace it completely with another anesthetic. Ethylene may be regarded, however, as one of the newer anesthetics, which will probably occupy an important place unless it is replaced by an agent which is less inflammable, or superior.

W. E. S.

The Arrangements for Meeting Places for Medical Societies

As previously stated in this Journal the meeting of the American Medical Association from June 9th to 14th was held on the new Municipal Pier in Chicago. It was the largest in point of attendance ever held. The various sections were all housed in subdivisions of the pier under one roof. The halls were made by building up the lateral walls from the floor to the roof and subdividing the long pier by means of some thin material similiar to compoboard. A small door was placed at the rear end of each hall for the purpose of entrance and exit of the fellows. A platform about three feet high was placed at the other end of each room and folding chairs were distributed throughout the hall.

While it was of great advantage to have all the sections meet under one roof and the space allotted for displays was ideal, there were some features about the arrangements for the meeting which were unsatisfactory and offer subject material for some observations.

The inadequacy of the halls themselves was perhaps more noticeable in the larger sections. The only provision for ventilation was through the small door in the rear of the hall. Incidentally, when this door was open or when the curtain overhanging it was pulled aside a flood of light entered the hall which interfered greatly with the demonstration of lantern slides. The acoustics were so bad that in some of the halls anyone situated toward the rear could hear only the loudest speakers. To add to the difficulty in hearing, street cars and trucks passing along outside the pier contributed sufficient noise to be most exasperating. In addition, the constant movement of the chairs about the floor incident to the coming and going or the restlessness of the fellows added to the turmoil. As a matter of fact, it was necessary for the individual, if he wished to hear the speakers, to sit so

near the front in some of the large halls that the lack of ventilation was most depressing. The absence of shaded drop-lights and speakers' stands was also noticeable.

Poor acoustics, poor ventilation and lack of facilities to show lantern slides always have a tendency to make the members become restive and at this meeting it was our observation that occasions in which those farthest from the stage were not talking with each other, moving their chairs around and adding to the inconvenience of those who were trying to listen were the exception rather than the rule.

It is an indisputable fact that the hall presenting perfect acoustics, immovable chairs, carpeted aisles, a maximum of elimination of noise and facility for the demonstration of lantern slides or motion pictures without unnecessary delays gives the speaker the best opportunity to present his subject and gives his listeners likewise an opportunity to gain the maximum benefit therefrom.

In these matters the local committee of arrangements of any medical association has an important duty to perform. Attention to the above mentioned details before the opening of the session should receive more attention than it has in the past.

Too often, men have spent a great deal of time and money in the preparation of lantern slides or motion pictures only to find on their arrival at the meeting place that no provision has been made for the exhibition of the same. While it is true that arrangements were made for the exhibition of motion pictures in a separate hall, this method of teaching and demonstrating has reached the stage where a motion picture outfit should be available before any of the sections should some contributor to the program find it desirable.

This criticism, which is intended to be entirely constructive, applies as well to the meeting places of all medical associations as to that of the national organization. In our opinion there is, however, decidedly less reason for failure to provide each section with the simple prerequisites mentioned above when considering the meeting of the American Medical Association than there is in regard to most other organizations and it is in the hope of bringing about an improvement in these important details during future meetings that this criticism is made.

OBITUARY

DR. O. M. HAUGAN

Dr. O. M. Haugan, well known physician of Fergus Falls, died at St. Luke's Hospital, Fergus Falls, May 25, 1924, as a result of cerebral hemorrhage and complications.

Dr. Haugan was born near Trondhjem, Norway, fifty-seven years ago. At the age of five he came with his parents, a brother and three sisters, to South Dakota. Here near the village of Volin, where he was raised, he was brought for burial in the family lot, where his parents and two sisters had been laid to rest before him.

After attending the country public schools, Otto Haugan went to Red Wing Seminary, where he graduated from the Collegiate Department. He also taught there during the last year of his course. He later taught in the public schools of Ottertail County, Minnesota, and in Iowa. He then entered the University of Minnesota and finished the literary course in three years, following which he returned to Ottertail County, where he served for several years as superintendent of the county schools.

Dr. Haugan received his medical training at Northwestern University. Following his graduation there in 1902 he came directly to Fergus Falls, where he practiced to the time of his death, a period of twenty-one years.

Dr. Haugan was a man of lovable disposition and was very popular in his community. While he kept abreast with medical progress by taking some post graduate work almost every year, he never lost his interest in educational activities to which his earlier life was devoted. He was a member of the school board and was much in demand as a public speaker at graduation exercises and at various meetings of young people's societies. His entire life was a reflection of early training in a Christian home and his motto in life was "Service." He died as he had lived in the midst of service to his fellow men.

THEO. S. PAULSON, M.D.

DR. BENJAMIN HARVEY OGDEN

Dr. Benjamin Harvey Ogden, St. Paul, died on June 12, at the age of sixty-four years.

Dr. Ogden was born in Northfield, Minnesota, where he received his early schooling and was graduated from Carleton College in 1881. He received his degree as Doctor of Medicine from Hahnemann Medical College of Philadelphia in 1885.

After practicing his profession in Northfield for a year, Dr. Ogden moved to St. Paul, where he was actively engaged as physician and surgeon until failing health a year ago forced him to retire. Dr. Ogden was a member of the staffs of Ancker, Miller, St. Luke's and St. Joseph's hospitals in St. Paul. He had also held the presidency of the State Homeopathic Society and was for a time connected with the College of Medicine at the University of Minnesota and held membership in both the Ramsey County and Minnesota State Medical Associations.

Dr. Ogden is survived by his wife, a daughter, Mrs. Arletta Kuby, and a son, Dr. Warner Ogden of St. Paul.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA STATE MEDICAL ASSOCIATION

The annual meeting of the Minnesota State Medical Association is scheduled to meet in St. Cloud, Wednesday, Thursday and Friday, October 8, 9 and 10, 1924. Arrangements for the program are nearing completion in the hands of the Program Committee, which is made up of the chairmen of the two sections, Medicine and Surgery, Dr. E. L. Tuohy, Duluth, and Dr. A. C. Strachauer, Minneapolis, and the secretary of the State Association, Dr. Carl B. Drake, St. Paul.

Dr. C. B. Lewis, St. Cloud, who is acting as chairman of general arrangements, is completing plans for the meeting with the aid of the following local committees:

Committee on Exhibits—H. W. Goehrs, Chairman, I. E. Bowing, H. F. Clark.

Committee on General Entertainment—Wm. Friesleben, Chairman, P. E. Stangl, T. N. Fleming.

Committee on Hotel Accommodations—J. H. Beaty, Chairman, J. C. Boehm.

Committee on Entertainment of Ladies—J. P. McDowell, Chairman, C. A. Rathburn.

Committee on Lantern Slides—M. J. Kern, Chairman, C. F. Brigham.

Committee on Reception of Members—W. L. Beebe, Chairman, A. D. Whiting.

Committee on Telephone Service—F. H. Stangl, Chairman, Julius Adams.

Committee on Meeting Places—C. S. Sutton, Chairman, J. S. Dunn.

Sign Committee—H. McGibbin, Chairman, L. P. Adams.

Golf Committee—J. J. Gelz, Chairman.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

The annual meeting of the Northern Minnesota Medical Association will be held in Duluth, Monday and Tuesday, August 4 and 5, 1924, in the auditorium of St. Mary's Hospital. The forenoons will be given to clinics, the scientific program being held each afternoon. Guests at the meeting will be entertained at a banquet Monday evening.

Clinics for the morning sessions have been arranged as follows:

Monday, August 4th, 8 A. M. to 12:30 P. M.—

Surgical Clinic:

Dr. T. L. Chapman

Dr. W. A. Coventry

Internal Medicine:

Dr. S. H. Boyer

Dr. F. W. Spicer

Dr. L. L. Merriman

Pediatric Clinic:

Dr. O. W. Rowe

Dr. C. O. Kohlbray

Orthopedic and Associated Clinics:

Dr. J. R. Kuth

Dr. B. F. Davis

Tuesday, August 5th, 8 A. M. to 12:30 P. M.:-

Internal Medicine Clinic:

Dr. E. L. Tuohy
Dr. T. R. Martin
Dr. F. J. Hirschboeck
Dr. P. G. Boman

Surgical Clinic:

Dr. A. N. Collins
Dr. A. J. Braden
Dr. A. L. McDonald

Surgical and Obstetrical Clinic:

Dr. J. R. Manley
Dr. W. R. Bagley

Skin and Genito-urinary Clinic:

Dr. E. Z. Shapiro
Dr. M. A. Nicholson

The following papers will be given at the afternoon sessions:

Address—Dr. Willard Bartlett, St. Louis, Mo.

"Forms of Organotherapy Which Have Proven to Be of Unquestionable Value." Dr. L. G. Rowntree, Rochester.

Address—Dr. C. N. Callander, Fargo, N. D.

"Acute Appendicitis." Dr. Theo. Bratrud, Warren.
Discussion: Dr. R. E. Farr, Minneapolis.

"Care and Treatment of Nephritis in Children." Dr. F. W. Schlutz, Minneapolis.

"Indications for Surgery in Duodenal Ulcer." Dr. Verne S. Cabot, Minneapolis.

"The Common Cold." Dr. F. W. Briggs, Duluth.

"Intestinal Parasites." Dr. M. A. Shillington, St. Paul.

"Fractures of the Hip." Dr. M. S. Henderson, Rochester.

"Some Little Appreciated But Valuable Therapeutic Measures." Dr. G. S. Wattam, Warren.

"Reminiscences of Thirty Years Ago." Dr. P. G. Cowling, Evansville.

"Fatigue in the School Child." Dr. Max Seham, Minneapolis.

"Diagnosis and Treatment of Upper Urinary Tract Obstruction." Dr. F. E. B. Foley, St. Paul.

Address—Dr. G. B. New, Rochester.

Address—Dr. H. Gideon Wells, Chicago, Ill.

"Some Phases of Epilepsy." Dr. E. M. Hammes, St. Paul.

"The History and Present Status of the Non-surgical Treatment of Hemorrhoids." Dr. W. A. Fansler, Minneapolis.

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

This Association, which meets annually, will convene in Toronto in August. The purpose of the association is to further "systematic direction to scientific inquiry" and "to promote the intercourse of those who cultivate science in different parts of the British Empire." Meetings are held annually in England and from time to time in various parts of the Empire. It last convened in Canada in 1909. The average enrollment for the 83 years previous to 1920 was 2,330.

The organization comprises thirteen sections. Those on Chemistry, Physiology and Psychology should be of

particular interest to the medical profession. Among the subjects that will be discussed are:

Advances made in our knowledge of disease.

Studies in visceral reflexes.

On the tactile sensory reflex.

Fractionate contractions in premature ventricular systoles in mammalian hearts.

Physiological and psychological factors of muscular efficiency in industry.

Vitamines and the relation of light to their action.

The respiratory quotient.

Insulin.

The list of those who will appear on the program includes the following names: H. H. Dale, A. B. Macallum, W. B. Cannon, Robert Kennedy, G. H. Parker, P. A. Shaffer, L. B. Mendel, T. B. Osborne, and D. D. Van Slyke.

The Physiology section will commence on Thursday, August 7. Physicians may obtain annual membership entitling them to convention privileges for the modest sum of \$5.00 sent to the local Hon. Treasurer, British Association, Room 50, Physics Bldg., University, Toronto. Additional information may be obtained from the local secretary at the same address.

REDWOOD-BROWN COUNTY MEDICAL SOCIETY

The annual meeting of the Redwood-Brown Medical Society was held at Sanborn, June 20, 1924. Officers elected for the following year were: President, Dr. J. Adams, Morgan; vice president, Dr. Theo. F. Hammermeister, New Ulm; secretary-treasurer, Dr. William A. Meierding, Springfield. Dr. F. D. Gray of Marshall was elected to act as delegate to the annual meeting of the State Medical Association in St. Cloud, with Dr. George B. Weiser, New Ulm, as alternate.

LYMANHURST AND PARKVIEW STAFF MEETING

The regular monthly meeting of the Lymanhurst and Parkview medical staffs will be held at the Lymanhurst School, 1800 Chicago Avenue, Minneapolis, Tuesday evening, August 26, at 7:00 o'clock.

The following program will be given:

"Review of Chemistry of Tuberculosis," Dr. W. P. Larson.

"Review of Calmet's Recent Work in Tuberculosis," Dr. W. P. Larson.

"Recent Developments in Bacteriology and Serology in Tuberculosis," Dr. Montank.

"The Pathology of Tuberculosis," Dr. Kano Ikeda.

All persons interested in tuberculosis are invited to attend these meetings and participate in the discussions.

INTER-STATE POST-GRADUATE ASSEMBLY

The Inter-State Post-Graduate Assembly, directed by the Tri-State District Medical Association, extends a hearty invitation to the physicians of America who are in good standing in their State or Provincial Societies to attend the annual assembly, which is to be held at Milwaukee, Wisconsin, October 27th, 28th, 29th, 30th and 31st, five full days of post-graduate work.

Among the eminent members of the profession and citi-

zens who have accepted places on the program are the following:

Dr. Nicholas Murray Butler, President of Columbia University, New York, N. Y.

Sir Arthur William Currie, President of McGill University, Faculty of Medicine, Montreal, Canada.

Merritte W. Ireland, Surgeon-General of United States Army, Washington, D. C.

Monsieur J. Jusserand, French Ambassador to United States, Washington, D. C.

Edward E. Stitt, Surgeon-General of United States Navy, Washington, D. C.

Professor Theodore Tuffier, Prof. of Surgery, Faculty of Medicine, Paris, France.

Dr. John V. Barrow, Los Angeles, California.

Dr. W. F. Braasch, Mayo Clinic, Rochester, Minnesota.

Dr. George E. Brewer, Emeritus Prof. of Surgery, Columbia University, College of Physicians and Surgeons, New York, N. Y.

Dr. Alan Brown, Prof. of Pediatrics, University of Toronto, Faculty of Medicine, Toronto, Canada.

Dr. Ralph C. Brown, Assistant Prof. of Medicine, Rush Medical College, Chicago, Illinois.

Dr. C. Macfie Campbell, Prof. of Psychiatry, Harvard University, School of Medicine, Cambridge, Massachusetts.

Dr. Walter T. Connell, Prof. of Medicine, Queen's University, Faculty of Medicine, Kingston, Canada.

Dr. John F. Cowan, Prof. of Surgery, Stanford University, School of Medicine, San Francisco, California.

Dr. George W. Crile, Prof. of Surgery, Western Reserve University, School of Medicine, Cleveland, Ohio.

Dr. Samuel J. Crowe, Clinical Prof. of Laryngology, Johns Hopkins University, School of Medicine, Baltimore, Maryland.

Dr. LeRoy Crummer, Prof. of Medicine, University of Nebraska, College of Medicine, Omaha, Nebraska.

Dr. Walter E. Dandy, Associate Prof. of Surgery, Johns Hopkins University, School of Medicine, Baltimore, Maryland.

Dr. William Darrach, Dean and Associate Prof. of Surgery, Columbia University, College of Physicians and Surgeons, New York, N. Y.

Dr. Vernon C. David, Assistant Prof. of Surgery, Rush Medical College, Chicago, Illinois.

Dr. David J. Davis, Prof. of Pathology and Bacteriology, University of Illinois, School of Medicine, Chicago, Illinois.

Dr. John B. Deaver, Prof. of Surgery, University of Pennsylvania, School of Medicine, Philadelphia, Pa.

Dr. Laurence R. DeBuys, Prof. of Pediatrics, Tulane University, School of Medicine, New Orleans, Louisiana.

Dr. George F. Dick, Assistant Prof. of Medicine, Rush Medical College, Chicago, Illinois.

Dr. Charles A. Elliott, Prof. of Medicine, Northwestern University, School of Medicine, Chicago, Illinois.

Dr. Leonard W. Ely, Prof. of Surgery, Stanford University, School of Medicine, San Francisco, California.

Dr. Joseph Evans, Prof. of Medicine, University of Wisconsin, School of Medicine, Madison, Wisconsin.

Dr. A. MacKenzie Forbes, Clinical Prof. of Orthopedics, McGill University, Faculty of Medicine, Montreal, Canada.

Dr. William Goldie, Associate Prof. of Medicine, University of Toronto, Faculty of Medicine, Toronto, Canada.

Dr. Marvin L. Graves, Prof. of Medicine, University of Texas, School of Medicine, Galveston, Texas.

Sir Henry Gray, Royal Victoria Hospital, Montreal, Canada.

Dr. Don M. Griswold, Prof. and Head of Department of Preventive Medicine and Hygiene, State University of Iowa, Iowa City, Iowa.

Dr. Garfield M. Hackler, Prof. of Surgery, Baylor University, School of Medicine, Dallas, Texas.

Dr. John A. Hartwell, Associate Prof. of Surgery and Clinical Surgery, Cornell University, Medical College, New York, N. Y.

Dr. Carl A. Hedblom, Prof. of Surgery, University of Wisconsin, School of Medicine, Madison, Wisconsin.

Dr. William B. Hendry, Prof. of Obstetrics and Gynecology, University of Toronto, Faculty of Medicine, Toronto, Canada.

Dr. Russell D. Herrold, McCormick Institute for Infectious Diseases, Chicago, Illinois.

Dr. Julius H. Hess, Prof. of Pediatrics, University of Illinois, School of Medicine, Chicago, Illinois.

Dr. Russell A. Hibbs, Prof. of Orthopedic Surgery, Columbia University, College of Physicians and Surgeons, New York, N. Y.

Dr. Frederick J. Kalteyer, Associate Prof. of Medicine, Jefferson Medical College, Philadelphia, Pennsylvania.

Dr. Allen B. Kanel, Prof. of Surgery, Northwestern University, School of Medicine, Chicago, Illinois.

Dr. Ralph A. Kinsella, Associate Prof. of Medicine, University of St. Louis, School of Medicine, St. Louis, Missouri.

Dr. Francis H. Lahey, Prof. of Clinical Surgery, Harvard University, School of Medicine, Boston, Massachusetts.

Dr. Dean Lewis, Prof. of Surgery, Rush Medical College, Chicago, Illinois.

Dr. LeRoy Long, Dean and Prof. of Surgery, University of Oklahoma, School of Medicine, Oklahoma City, Oklahoma.

Dr. William E. Lower, Prof. of Urology, Western Reserve University, School of Medicine, Cleveland, Ohio.

Dr. Charles B. Lyman, Prof. of Clinical Surgery, University of Colorado, School of Medicine, Denver, Colorado.

Dr. N. J. MacLean, Associate Prof. of Surgery, University of Manitoba, Faculty of Medicine, Winnipeg, Canada.

Dr. Ralph H. Major, Prof. and Head of Department of Medicine, University of Kansas, School of Medicine, Rosedale, Kansas.

Dr. Charles H. Mayo, Mayo Clinic, Rochester, Minnesota.

Dr. William J. Mayo, Mayo Clinic, Rochester, Minnesota.

Dr. Edward Miloslavich, Director of Department of Pathology and Bacteriology, Marquette University, School of Medicine, Milwaukee, Wisconsin.

Dr. Roger S. Morris, Prof. of Medicine, University of Cincinnati, School of Medicine, Cincinnati, Ohio.

Dr. Bernard H. Nichols, Department of Roentgenology, Cleveland Clinic, Cleveland, Ohio.

Dr. Walter L. Niles, Dean and Prof. of Clinical Medicine, Cornell University, School of Medicine, New York, N. Y.

Dr. Dallas B. Phemister, Assistant Prof. of Surgery, Rush Medical College, Chicago, Illinois.

Dr. William F. Petersen, Associate Prof. of Pathology and Bacteriology, University of Illinois, School of Medicine, Chicago, Illinois.

Dr. Harry M. Richter, Prof. of Surgery, Northwestern University, School of Medicine, Chicago, Illinois.

Dr. Stanley P. Reimann, Director of Laboratories, Lankenau Hospital, Philadelphia, Pennsylvania.

Dr. David Riesman, Prof. of Clinical Medicine, University of Pennsylvania, School of Medicine, Philadelphia, Pennsylvania.

Dr. Milton J. Rosenau, Prof. of Preventive Medicine and Hygiene, Harvard University, School of Medicine, Boston, Massachusetts.

Dr. E. C. Rosenow, Mayo Clinic, Rochester, Minnesota.

Dr. G. W. Stevens, Milwaukee, Wisconsin.

Dr. Wallace Irving Terry, Prof. of Surgery, University of California, School of Medicine, San Francisco, California.

Dr. John H. J. Upham, Prof. and Head of Department of Medicine, University of Ohio, School of Medicine, Columbus, Ohio.

Dr. George Gray Ward, Jr., Prof. of Obstetrics and Gynecology, Cornell University, School of Medicine, New York, N. Y.

Dr. Louis M. Warfield, Prof. of Internal Medicine, University of Michigan, School of Medicine, Ann Arbor, Michigan.

Dr. George Weaver, McCormick Institute for Infectious Diseases, Chicago, Illinois.

Dr. Charles J. White, Prof. of Dermatology, Harvard University, School of Medicine, Boston, Massachusetts.

Dr. Charles S. Williamson, Prof. of Medicine, University of Illinois, School of Medicine, Chicago, Illinois.

Dr. Milton C. Winternitz, Dean of Yale University, School of Medicine; Prof. of Pathology and Bacteriology, New Haven, Connecticut.

Dr. John A. Witherspoon, Prof. of Medicine, Vanderbilt University, Medical Department, Nashville, Tennessee.

Dr. John L. Yates, Milwaukee, Wisconsin.

Dr. Hugh H. Young, Clinical Prof. of Urology, Johns Hopkins University, Medical Department, Baltimore, Maryland.

Dr. Abraham Zingher, Assistant Prof. of Hygiene, University and Bellevue Hospital, Medical College, New York, N. Y.

This Association is supervising an Inter-State Post-Graduate Clinic Tour to Canada, British Isles and France, to start May 18, 1925. Leading teachers and clinicians of Canada and Europe will arrange and conduct clinics and demonstrations in the following clinic cities: Toronto and Montreal, Canada; London, Liverpool, Leeds, Manchester and Newcastle, England; Edinburgh and Glasgow, Scotland; Dublin and Belfast, Ireland; Paris, Lyons and Strasbourg, France.

Besides the main tour, special tours to practically all the leading centers of Europe will be arranged. Sightseeing trips to all places of interest in the countries visited will be included in the regular tour.

The cost of the tour, including first-class hotels, board, steamship, clinic arrangements and all ordinary traveling expenses, will be under \$1,000.00. The tour is open to

physicians in good standing in their State Societies, their families and friends who are not physicians.

Those desiring further information should communicate with the Managing Director, William B. Peck, Freeport, Illinois.

WABASHA COUNTY MEDICAL SOCIETY

The fifty-sixth annual meeting of the Wabasha County Medical Society was held at Lake City, Minnesota, Thursday, July 10, 1924.

Following the business session a dinner was served at the Hotel Lyon at 1 P. M.

Papers presented at the afternoon session included:

President's Address, "Some Matters Pertaining to the Welfare of the Medical Profession." Dr. W. H. Repogle, Wabasha.

"Studies in Hepatic Function." Dr. C. H. Green, Surgical Section, Mayo Clinic, Rochester.

"Some Aspects of the Nephritis Problem." Dr. N. M. Keith, Medical Section, Mayo Clinic, Rochester.

Officers elected for the coming year are: President, Dr. H. E. Bowers, Lake City; vice president, Dr. R. S. Gutsell, Zumbro Falls; secretary-treasurer, Dr. W. F. Wilson, Lake City.

Resolutions were adopted favoring periodic health examinations, reasonable publicity regarding accomplishments and aims of scientific medicine, measures to control quacks and irregulars.

It was voted to hold the next meeting at Plainview, Minn.

OF GENERAL INTEREST

Dr. P. J. Griffin, lately of Detroit, Minn., recently moved to his former location at Fertile.

Dr. J. C. Rothenburg, Springfield, recently returned from a motor trip through Montana.

Drs. A. F. and Mary Strickler of Sleepy Eye have just returned from a tour of the western states.

Dr. R. B. Hullsiek, St. Paul, is associated with Dr. C. N. Hensel, 1014 Lowry Bldg., in the practice of internal medicine.

Eternal vigilance in the matter of vaccination seems to be necessary for the prevention of smallpox. From the first of the year until May 31st, 1,341 cases and 109 deaths have been reported in Detroit, Michigan.

Dr. H. L. Sargeant, who has just finished a two-year post-graduate course at the Mayo Clinic, Rochester, recently moved his family to Fergus Falls, where he is associated with Dr. O. T. Sherping and Dr. C. O. Estrem in the practice of his profession.

Dr. and Mrs. F. P. Strathern of St. Peter spent the latter part of June and the first of July in Chicago and Battle Creek, Michigan, where Dr. Strathern took advantage of the opportunity to make a study of interpretation of x-rays of the chest and abdomen.

Dr. R. C. Webb, Minneapolis, read a paper on "Fractures of the Tibia and Fibula" before the Great Northern Railroad Surgeons Association at Spokane, Washington, June 24, 1924. Dr. Webb also attended the Northwestern

Medical Association meeting in Vancouver, B. C., June 26 to 28.

In a recent address, Dr. Banting related how the observation by Dr. Moses Barron of Minneapolis of the effect of experimental ligation of the pancreatic duct led to the deduction that by this means it might be possible to eliminate the products of the acinous cells and obtain the product of the islets. Thus is research founded upon research.

Resignation of Miss Louise M. Powell as director of the School of Nursing, University of Minnesota, and of Dr. LeRoy A. Calkins, as assistant professor of Gynecology and Obstetrics, were recommended to the president of the Administrative Board of the Medical School at a meeting held June 23, 1924. The secretary was instructed to convey to both the expression of the regret and appreciation of the Administration Board.

The following nominations were approved and recommended at the May meeting of the Administrative Board of the Medical School, University of Minnesota: Dr. Frank W. Stevenson, as Assistant in Medicine; Dr. G. R. Kamman, as Assistant in Nervous and Mental Diseases; Dr. H. W. Grant, as Assistant in Ophthalmology and Otolaryngology; Dr. A. N. Noran, as Assistant in Pediatrics. The resignation of Dr. A. L. Kusske as refractionist was accepted and nomination was made of Dr. Harold J. Goss to fill the vacancy.

Under the sponsorship of the Illinois State Medical Society there is in preparation "A History of Medical Practice in the State of Illinois" that must go to the printer at an early date. In order that this volume may be accurate and complete, all possible assistance is asked from every source, as to personal data and experiences, including diaries, photographs and similar documentary momentoes of pioneer Illinois doctors and of progressive phases of medical practice, as well as of achievements in fields other than those of medical science. Prompt return in good condition is promised for anything loaned the committee, the personnel of which is:

O. B. Will, M.D., Peoria, Ill.
C. B. Johnson, M.D., Champaign, Ill.
Carl E. Black, M.D., Jacksonville, Ill.
George A. Dicus, M.D., Streator, Ill.
James H. Hutton, M.D., Chicago, Ill.
Chas. J. Whalen, M.D., Chicago, Ill., Chairman

The scope of the volume will range from the discovery of Illinois to modern times. Through this period of over 250 years there is much of thrilling interest to be detailed. Collection of the human interest data can come only from the families or closest friends of the pioneers, many of whom long ago removed to distant sections of the United States.

Some of the subjects touched will be: Physicians accompanying early explorers; government surgeons and physicians in attendance at the forts; early medicine in Illinois; theories of healing from the days of the Aborigines through the mound-builders; French and English explorers; the ante-boundary days; sporadic settlers; medical attendants for the covered wagon; herb doctors; primitive surgery; medicine and missionaries; migration of pioneer physicians to new territory; the "circuit-riding"

and "saddle-bag" doctors and their burdens, triumphs and perils; pioneers as "utility citizens"; Illinois men in war time—there are four conflicts to be considered since the opening of the Nineteenth Century; Illinois medical men away from medicine, i.e., in industry, in science, in belles-lettres—art, music and literature. Will any and all doctors, former residents of Illinois, or descendants of pioneer physicians of the "Illinois country," communicate at once with the Committee on Medical History, Illinois State Medical Society, 6244 North Campbell Avenue, Chicago, Illinois?

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

ABBOTT LABORATORIES:

Benzyl Fumarate

DESHELL LABORATORIES:

Petrolagar

Petrolagar (Unsweetened)

Petrolagar (with Phenolphthalein)

Petrolagar (Alkaline)

HOFFMANN-LA ROCHE CHEMICAL WORKS:

Digalen-Roche (Cloetta)

Ampules Digalen-Roche (Cloetta), 1.1 c.c.

Tablets Digalen-Roche (Cloetta)

Hypodermic Tablets Digalen-Roche (Cloetta)

Oleo-Bi-Roche

Ampules Oleo-Bi-Roche, 2 c.c.

MEAD JOHNSON AND COMPANY:

Mead's Cod Liver Oil

H. A. METZ LABORATORIES:

Sulpharsphenamine-Metz in 0.05, 0.075, 0.1, 0.15, 0.3, 0.45, 0.6 gm. ampules.

FREDERICK STEARNS AND COMPANY:

Insulin-Stearns

Insulin-Stearns Single Strength

Insulin-Stearns Double Strength

NEW AND NON-OFFICIAL REMEDIES

Neutral acriflavine-Abbott, 0.1 Gm. Ampules.—Each ampule contains 0.1 gm. neutral acriflavine-Abbott (see New and Non-official Remedies, 1924, p. 24). The Abbott Laboratories, Chicago.

Insulin-Stearns.—A brand of insulin. For a discussion of the actions, uses and dosage, see New and Non-official Remedies, 1924, p. 149. Insulin-Stearns is marketed: insulin-Stearns, single strength (5 c.c. vials containing 10 units in each c.c.), and insulin-Stearns, double strength (5 c.c. vials containing 20 units in each c.c.). Frederick Stearns and Co., Detroit.

Digalen-Roche (Cloetta).—A sterile solution containing in each c.c. 0.3 mg. of an active derivative of digitalis as isolated by Cloetta, containing 7.5 per cent of alcohol. The actions and uses of digalen-Roche (Cloetta) are the same as those of digitalis. The average dose is from 1 to 2 c.c. (15 to 30 minims). The maximum daily dosage is 6 c.c. (90 minims). Digalen-Roche (Cloetta) is also suitable for intramuscular and intravenous injection. Intravenous injections of 1 c.c. (15 minims) may be repeated at intervals

of one-half to one hour as necessary. Digalen-Roche (Cloetta) is also marketed as follows: ampules digalen-Roche (Cloetta), 1.1 c.c.; tablets digalen-Roche (Cloetta) (equivalent to digalen-Roche (Cloetta) 0.5 c.c.); hypodermic tablets digalen-Roche (Cloetta) (equivalent to digalen-Roche (Cloetta), 1 c.c.). The Hoffman-La Roche Chemical Works, New York. (Jour. A. M. A., June 14, 1924, p. 1937.)

Petrolagar.—A mixture composed of liquid petrolatum 65 c.c., agar 10 gm., sugar and flavoring 2 gm., sodium benzoate 0.1 gm., water to make 100 c.c. Petrolagar has the actions of liquid petrolatum. It is claimed that the emulsification of the liquid petrolatum increases its efficiency, and that the agar adds soft bulk and tends to increase peristalsis. The average dose of petrolagar is 15 c.c. morning and night. Petrolagar is also marketed in the form of petrolagar (unsweetened), containing no sugar. petrolagar (with phenolphthalein), containing 0.33 gm. phenolphthalein per 100 c.c., petrolagar (alkaline), containing milk of magnesia 25 c.c. per 100 c.c. The Deshell Laboratories, Inc., Los Angeles. (Jour. A. M. A., June 28, 1924, p. 2119.)

PROPAGANDA FOR REFORM

Chologogues.—As early as 1868, a British committee appointed to investigate the subject arrived at the conclusion that mild mercurous chlorid (calomel), mercuric chlorid and taraxacum—all reputed chologogues—do not increase the flow of bile but probably act on the bile-expelling apparatus. Recently the latest experimental procedure was applied to judge the status of a number of substances that have at various times been alleged to influence bile flow. With the exception of bile salts, negative results only were obtained with such substances as calomel and salicylates. All dependable evidence warrants the recommendation that clinicians consider the advisability of abandoning therapeutic efforts to "stimulate" the liver through the use of substances having alleged chologogic effects. (Jour. A. M. A., June 7, 1924, p. 1867.)

Gly-So-Iodonate.—A few months ago the Council on Pharmacy and Chemistry published a report on an alleged bactericide "Gly-So-Iodonate." The product is put on the market by a company whose name is much more imposing than its importance warrants—"The National Medical Research Laboratories" of Milwaukee, earlier known as the "Wisconsin Medical Laboratories." Charles E. Hutchings, who claims to be a "medical man," seems to have been the prime mover in putting "Gly-So-Iodonate" on the market. Hutchings, in letters, has stated that he is a "graduate of Kings College of London" and has claimed that he is a "member of Marquette Medical College." However, an inquiry directed to Kings College of London brought the reply that they had no record of a man of this name on the medical register. The Marquette University School of Medicine seems to be equally ignorant of Hutchings' connection with that institution. After the Council's report had been published, the National Medical Research Laboratories sent broadcast a six-page circular, three pages of which were devoted to what purported to be a "Partial List of Representative Industries Protecting Their Many Thousands of Employees from Infection With G-S-I." As it seemed reasonable to suppose that a concern which published a misleading formula for its product would be quite as likely

to publish misleading references for the value of its product, some of the "representative industries" listed by the exploiters of "G-S-I" were written to. From the replies which were received, it seems evident that the basis for at least some of the references published by the exploiters of Gly-So-Iodonate rests on as flimsy a foundation as the alleged formula of the stuff and the educational claims of Charles E. Hutchings. (Jour. A. M. A., June 7, 1924, p. 1881.)

Morphin Addiction.—The so-called withdrawal symptoms which arise in those who have become accustomed to large doses of morphin are well known to all practitioners who are compelled to deal with such habitués. To account for these symptoms it has been alleged that the continuous taking of morphin causes the presence in the blood serum of a substance having a protective effect against this drug. However, it has been shown that the blood of a tolerant animal does not contain any protective substance against morphin, nor was there any substance capable of conferring any immunity to the toxic action of morphin on an animal into which it is injected detected in the blood serum of a human being who has acquired a high tolerance to morphin. Also, it has been proven that a specific toxic substance is not produced by habituation to morphin. Since some methods of treating drug addiction have been based on the belief that a toxic substance is formed, the time has arrived for seeking a new point of departure in the explanation of the various manifestations that are presented by drug addicts. (Jour. A. M. A., June 14, 1924, p. 1976.)

Whittington's Consumption Cure a Fraud.—The postal authorities have closed the mails to Frederick Graham and the Tuberculosis Home Remedy Company by the issuance of a fraud order. The Whittington "Cure" was the subject of a report in The Journal of the American Medical Association in 1916; analysis in the A. M. A. Chemical Laboratory at that time showed it to be a flavored syrup devoid of any potent ingredients except alcohol. The evidence brought out in the hearing by the Post Office authorities showed that the preparation was claimed to contain sugar, glycerin, alcohol and the extract matter from *pyrus malus folia* (apple leaves), gentian root, *rhamnus purshiana* (cascara) and licorice root. Analyses in the Bureau of Chemistry of the Department of Agriculture indicated the absence of gentian and the presence of only traces of cascara and licorice. No evidence was submitted to show how apple leaves had come to be hit upon as a "cure" for tuberculosis. (Jour. A. M. A., June 14, 1924, p. 1933.)

Atussin, Peptoproteasi, Paraganglina Vassale, Fosfoplasmina, Asmoganglina and Endo-Ovarina Tablets Not Accepted for N. N. R.—These products are manufactured in Italy and sold in the United States by the Neother Products Co., New York. Atussin is claimed to be a suprarenal preparation; Peptoproteasi, a gastric ferment preparation; Paraganglina Vassale, a suprarenal product; Fosfoplasmina, an egg yolk extract; Asmoganglina, an extract of the suprarenal and hypophysis, and Endo-Ovarina Tablets, an ovary preparation. In each case the statements made in regard to composition were indefinite and the therapeutic claims unwarranted. The booklet which the Neother Products Co. uses as advertising for these products consists of 151 pages, presents a jumble of fact and fancy, and reads more like a

patent medicine almanac than a scientific treatise. The Council on Pharmacy and Chemistry found Atussin, Peptoproteasi, Paraganglina Vassale, Fosfoplasmina, Asmoganglina and Endo-Ovarina Tablets unacceptable because: (1) their composition is indefinite or semisecret; (2) the therapeutic claims are unwarranted, and (3) their recognition would be the means of advertising proprietary products which are not accepted. (Jour. A. M. A., June 21, 1924, p. 2068.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS

ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

ACUTE PELVIC ABSCESS IN CHILDREN: Philip Rosenblum and Ralph E. Bettman (Amer. Journal of Diseases of Children, April, 1924). The author reports three cases of acute pelvic abscess formation, with relief of symptoms in each case after drainage. In the first two, this occurred spontaneously through the vagina and in the third case artificially by operation. In the third case the cause of the abscess was proved to be not the appendix, and it probably did not originate from the internal genitalia, which were palpated and found to be normal. The abscess possibly originated from the retroperitoneal structures and was presumably of glandular origin. The frequent association of abdominal pain with throat conditions in childhood, recently brought to our attention by Brennemann, is new to us. Some pelvic abscesses might be from just such infections involving the lymph glands which break down. He is absolutely at a loss to explain the source otherwise. They were not appendiceal abscesses. These, of course, may rupture spontaneously, but they almost invariably rupture into the bowel. A spondylitis might give rise to a pelvic abscess but no signs or symptoms pointing to spinal origin were present, nor in such cases would the patients be apt to recover spontaneously. The fact that all three cases occurred in female patients, and that in two there was a discharge of pus from the vagina, might point to the genitalia as the source. Pyosalpinx has been known to occur in infants, and must be considered as a possible etiologic factor.

R. N. ANDREWS.

UBER INTRAPERITONEALE BLUT TRANSFUSION-EN: L. F. Meyer (Jahrb. f. Kinderheilkunde, Mar. 5, 1924, s. 188-200). Meyer has used the intraperitoneal method of giving citrated blood in 25 cases. He uses this method in any case in which a transfusion is indicated. His technique differs in one important point from the original procedure introduced by us. He has not found it necessary to group his donor and recipient and has not observed any ill effects. If this is substantiated by further clinical re-

ports, it materially enhances the value of intraperitoneal transfusions. Meyer concludes that the results obtained from intraperitoneal transfusion are equivalent to those following direct intravenous transfusion.

DAVID SIPERSTEIN.

KLINISCHE UND EXPERIMENTELLE BEWEISE FUR DIE LEBENSFAHIGKEIT TRANSFUNDIERTER KORPERFREMDER ERYTHROCYTEN: Hañs Opitz (Monatschr. f. Kinderheilk., Bd. 27, Jan., 1924, Heft. 4, pp. 376-384). Opitz concludes, from an extensive series of clinical cases, that large transfusions of blood are especially suitable for the anemias of infancy. He considers the transfusion a means of introducing active and functional blood cells into the patient's circulation. The intravenous injection of plasma alone produced no rise in blood values, while the introduction of washed red blood cells caused a proportionate rise in the erythrocyte count. He finds that the injected blood does not act as a stimulative agent and as "building material" for new red cells, but that the injected cells actually function. His clinical data are, however, too accurate to be convincing to the reviewer.

DAVID SIPERSTEIN.

UBER ANEMIA PERNICIOSA UND PERNICIOSA-AHNLCHE ANEMIEN IM KINDESALTER: Hotz, A. (Jahr. f. Rinderh., Mar. 5, 1924, pp. 161-181). Hotz reports a case of pernicious anemia in a girl of 10, diagnosed by Nægeli. The patient presented typical clinical and hematological findings.

He also reports 2 very interesting cases of anemia of the pernicious type, who clinically presented a typical picture of a severe chronic digestive insufficiency (Herber's Infantilism). The clinical findings differentiate these cases from a true pernicious anemia. Furthermore, in one of his cases, the blood findings were characteristic of a secondary anemia, except at the height of the anemic stage.

DAVID SIPERSTEIN.

TUBERCULOSIS IN INFANCY—ITS PROGNOSIS AND PREVENTION: G. Albert Davis (Arch. of Ped., March, 1924). Tuberculosis in infants has always been considered a more or less hopeless condition. In a series of 114 cases under two years studied by Brown, the mortality was 70 per cent. Fishberg states that at least one out of three tuberculosis infected infants lives. It must be thoroughly understood, however, that we are speaking of cases which show tuberculous infection as evidenced by positive skin tests, and we are not limiting ourselves to cases showing symptoms of tuberculosis. Thus it is seen that tuberculous infection in infants under two years is not the virulent disease that it was previously considered. Under one year of age it is still a very severe infection with the chances against recovery, but not so in the age period between one and two years. In 77 per cent of our cases there was a definite history of exposure to a case of tuberculosis. This is the vulnerable point. Where the diagnosis is doubtful, as so frequently occurs, it is a wise precaution to give the infant the benefit of the doubt, and remove it from the questionable environment.

R. N. ANDREWS.

ROENTGENOLOGY

SUPERVISORS:

LEO G. RIGLER,
MPLS. GEN'L HOSPITAL, MINNEAPOLIS

A. U. DESJARDINS,
MAYO CLINIC, ROCHESTER

FUNDAMENTAL FACTS RELATIVE TO THE STUDY OF THE VERTEBRÆ IN INDUSTRIAL ACCIDENT CASES: George and Leonard (Radiology, April, 1924). This article presents a discussion of the roentgen findings in the vertebræ in relation to industrial work. An attempt has been made to describe clearly the average normal vertebra with a plate of a reconstructed skeleton as a key.

A number of normal variations in the vertebra are common. Among the most important are: (1) Bifid laminae of the 5th lumbar; (2) sacralization of the 5th lumbar; (3) rudimentary rib on the 12th thoracic or enlarged transverse process on the first lumbar. All of these variations, in their opinion, have no clinical significance whatever.

Certain changes occur in the vertebra which they classify as: (1) Chronological, (2) Occupational, (3) Postural. These include scoliosis, hypertrophic, and sclerotic changes, which they believe probably are not due to injury at all, and certainly not to one single injury. They believe these changes occur normally with age and as the result of a particular occupation.

Under the effects of injury to the vertebræ they classify:

- (1) Compression fracture of the body with few clinical and no neurological symptoms, followed by complete recovery.
- (2) Compression of the body with comminution with more symptoms and a less favorable prognosis.
- (3) Compression or comminution or both with a dislocation accompanied by very serious manifestations.
- (4) Simple dislocation without any visible fracture.
- (5) Kummell's disease, which is a rarefaction of the body of the vertebra gradually producing a wedge shape, believed by Kummell to follow injury after a long period of time. George and Leonard believe this occurs in older people and probably has no direct relationship to any recent injury.

They note that no matter how severe a fracture is, complete obliteration of the intervertebral space never occurs. They do not believe that complete fusion of two bodies can ever occur following injury. The body of the 5th lumbar vertebra is rarely compressed but the transverse processes are frequently broken.

Considerable detail is given to the discussion of fractures of the atlas and axis. The authors describe their method of determining malposition by drawing parallel lines connecting points on the atlas and axis. Distortion of these lines indicates some injury.

The authors doubt very seriously that spondylolisthesis is always due to injury because they have seen it frequently without injury, and also have observed it in patients who had no symptoms. They feel that more proof is needed before the roentgenologist can state in a report that spondylolisthesis has been due to injury.

The clinical use of the term "sacro-iliac dislocation" is sharply criticized. It requires extreme direct violence to produce this actually, and they have seen it only rarely in cases wherein it followed simply stooping or lifting. They note that the clinical diagnosis is made practically always without real x-ray substantiation. Sacro-iliac separation, that is a lateral separation, occurs. It is best seen in females with repeated pregnancies. This is not a dislocation, however.

The hypertrophic changes which occur with age are confusing in the interpretation of plates following injury. It is possible that local hypertrophic changes between two vertebræ may be the result of an injury, but even this has not been proven. The general hypertrophic changes they feel certain have no relationship to one injury. Acute osteomyelitis may be followed by new bone formation which simulates local hypertrophic changes. They attempt to distinguish true infectious arthritis from these hypertrophic changes by the fact that the new bone formation following the former condition is located on the lateral margins of the vertebra while the pathology of the latter condition is located on the anterior margin of the vertebra.

They emphasize that complete fusion of two vertebræ is always due to an infectious process, most often tuberculosis or a congenital anomaly. Tumors and syphilitic changes are rarely met with in industrial cases.

LEO G. RIGLER, M.D.

X-RAY DIFFERENTIAL DIAGNOSIS IN PULMONARY TUBERCULOSIS: H. L. Sampson (Trudeau Sanatorium, Annual Report 23). Inasmuch as analysis of roentgenograms lies in one's ability to understand the reasons for normal or abnormal shadows, one must necessarily acquaint himself with roentgenograms of the theoretically normal parts under consideration. It is true that the theoretically normal, in the case of lungs, may vary within wide limits. However, that should not deter us in attempting to standardize such a normal, bearing in mind that time and accumulation of knowledge may tear down our previous concepts.

In the normal lungs we have two fields traversed by many linear markings radiating from two central points. That all of this arborization is the result of shadows cast by pulmonary systems, viz.: vascular, bronchial and lymph, is probably accepted by all. That one system, the vascular, contributes mostly to these shadows can probably be demonstrated. It is also quite probable that the bronchial "tree" plays an important part, but ordinarily it is very difficult to "identify." The lymph channels also go unrecognized as such.

These said "trees" or linear markings start from a root and continue peripherally in a more or less uninterrupted fashion until the periphery is almost reached, becoming more delicate in consequence of their diminishing size. Any gross interference with this linear appearance obviously would suggest anatomical abnormality or a pathological change in the lung.

In the theoretically normal lung, we may find at the root a density or two, or possibly in the lung field a shadow or two of a similar character, only usually smaller, or a localized increase in the shadow, producing value of some of the linear markings. The question then arises, how numer-

ous can these densities or the stage of exaggeration of the linear markings become before we can regard them as evidence of past or present pulmonary disease. For this reason the author has submitted a division of roentgenograms into the following groups:

1. The theoretically normal:

This would mean a roentgenogram void of any abnormal densities. As this probably rarely exists we can standardize the "normal" as having one or a few abnormal densities at the root with possibly an occasional density in the parenchymal field.

2. Doubtful group:

Under this we have: More numerous densities, the root shadow more pronounced, a general haze in a portion of the pulmonary field, a tenting or peaking of the diaphragm, a secondary shadow in the extreme apex immediately under the second rib posteriorly and referred to as a pleural cap, and finally a slight localized or general accentuation of pulmonary markings.

3. Positive group:

Obviously this group includes anything in excess of the foregoing groups, namely, coalescing of isolated densities, blotching, shadows, fans, mottling, speckling, gross exaggeration of linear markings, heavy homogeneous shadows.

The following terms are used:

1. Exaggerations of lung markings, doubtful or definite.
2. Stringlike shadows.
3. Mottling, fine or coarse.
4. Areas of rarefaction and annular shadows.
5. Homogeneous densities—localized or general light marked.

The possibility of identifying pulmonary tuberculosis lies in the ability to recognize the tubercle and its accompanying changes. The same reasoning may be applied to other pathological conditions in the lung, namely, that they may produce characteristic shadows. Pulmonary abscess many times gives a very classical picture, viz., a localized homogeneous density with an area or areas of rarefaction, a fluid level, etc.

Bronchiectasis or purulent bronchitis with its heavy markings to the base rarely with a fluid level in the bronchiectatic cavities gives also a somewhat familiar picture.

Malignancy having such a variety of forms gives pictures where a description is almost impossible. However, usually there are massive localized shadows or general homogeneous densities. This may also be the case with other common or rarer forms of pulmonary disease. J. R. FUCHLOW.

ROENTGEN-RAY THERAPY IN THE TREATMENT OF EXOPHTHALMIC GOITER: D. M. Goodwin, W. B. Long (Amer. Jour. of Med. Science, January, 1924) have made a study of the results obtained by roentgen-ray therapy in a series of selected cases of hyperthyroidism. They emphasized the fact that their report is submitted not particularly to recommend roentgen-ray therapy, but to record their observations on the clinical course of these cases of very definite toxic exophthalmic types. These cases all showed, in addition to the thyroid tumors, the usual symptoms of thyroid toxemia, namely, tachycardia, sweating, exophthalmus, loss of weight, and increased metabolism. With the exception of a few cases, all of these patients remained at home, following as closely as possible certain

directions as to rest, diet, etc. They reported at the clinic once a week, and on these visits a record was made of their weight, pulse rate and subjective symptoms. Frequent estimations of the basal metabolic rate were made.

The roentgen-ray technique consisted in the administration of approximately two-fifths of an erythema dose, filtered through aluminum, to alternate sides of the neck each week. The region to which the application was made embraced that part of the neck and thorax lying between the upper level of the thyroid and the upper level of the third rib. A uniform distance of 35 centimeters from the target to the skin was used. Filtration was accomplished by 3 millimeters of aluminum. The potential at the tube terminals was 140,000 volts each, corresponding to a spark gap of 10 inches between points. Five milliamperes were used, and the time of exposure was uniformly 5 minutes, with the exception that in highly toxic cases this dose was still further reduced. They state that such a dose as this may be given weekly to alternate sides of the neck for months without any evident permanent skin damage.

They include a series of five charts, showing the course of cases, with their recorded observations on the various symptoms, such as nervousness, sweating, palpitation, dyspnea, weakness, pulse, weight, and basal metabolism; also, the number of treatments and the dates on which they were given.

Examination of these charts gives the impression of very gratifying improvement under this type of therapy. There was a very definite increase in weight, with a very definite decline in the metabolism rate. The pulse curve usually showed a downward trend. The change produced in the subjective symptoms was marked, although the improvement in these cases was a matter of months. It usually took a period of five months before there was any impressive change.

However, all of the cases treated did not show the very satisfactory improvement in the subjective and objective symptoms, but apparently were uninfluenced by the therapy. One of these cases, in which the course of the disease apparently remained unchanged after a total of 22 treatments, became discouraged, and requested an operation. This gave an opportunity of studying the gland both macroscopically and microscopically. They point out that the operative technique was not rendered particularly difficult by the previous radiation. The microscopic examination showed no very definite changes which might be ascribed to the roentgen-ray, except the absence of dilated capillaries, which are found rather constantly in goiters of this type.

Besides the charts referred to, there are complete case reports in all of these cases.

In summarizing, they bring out the following points:

(1) In 5 of the 9 cases treated the results of treatment have been satisfactory.

(2) In 1 case the influence of treatment was doubtful, and in another no conclusion can be drawn because treatment was interrupted.

(3) In the 2 remaining cases the toxemia seemed to increase in spite of prolonged treatment.

(4) In the 5 favorable cases they were unable, as yet, to speak of the permanency of benefit or tendency to recurrence of symptoms.

DR. P. G. BOMAN.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

LIFE INSURANCE EXAMINATION. Frank W. Foxworthy, Ph.B., M.D., Indianapolis. Formerly Chairman Medical Section, American Life Convention, President American Association of Medical Examiners, etc. 738 pages. 156 illus. Cloth, \$9.00. St. Louis: C. V. Mosby Company, 1924.

MODERN METHODS OF TREATMENT. Logan Glendenning, M.D., Asst. Prof. of Medicine, Lecturer on Therapeutics, Medical Dept. Univ. of Kansas; Attending Physician Kansas City General Hospital, etc. Chapters on special subjects by H. C. Anderson, M.D., J. D. Cowherd, M.D., Carl O. Rickter, M.G., F. C. Neff, M.D., E. H. Skinner, M.D., and E. R. De Weese, M.D. 692 pages. Illus. Cloth, \$9.00. St. Louis: C. V. Mosby Co., 1924.

EAT YOUR WAY TO HEALTH. Robert Hugh Rose, A.B., M.D., Instructor Post Graduate Medical School, New York City. 264 pages. Cloth, \$2.00. New York: Funk & Wagnalls Company, 1924.

A DIABETIC MANUAL. Elliott P. Joslin, M.D., Clinical Professor of Medicine, Harvard University. 211 pages. Illus. 3rd edition, revised. Cloth, \$2.00. Philadelphia: Lea and Febiger, 1924.

This book, small compared to the one entitled "Treatment of Diabetes," by the same author, is still more pretentious than some of the other manuals for diabetic patients.

One of the greatest difficulties in the successful treatment of this disease is the education of the patient. How far that should go is subject to some difference of opinion. The more intelligent patients want extensive information and for them such a book as this is suitable. It is too complete, perhaps, for the average patient.

Included among the instructions for patients are numerous tables of great practical value in the treatment of this malady all included between the covers of one book. These include normal weights for children and adults and a very limited number of typical diets. Menus for a greater variety of combinations of food elements would have made the book more valuable to the profession.

The tables on food composition are very complete, including the so-called "diabetic foods," and are therefore of special value to the dietitian or physician who must so often be dietitian as well. The long list of diabetic recipes enables the patient to add variety to an otherwise sameness in diet.

RHUS DERMATITIS: Its Pathology and Chemotherapy. James B. McNair, Univ. of Chicago. 293 pages. 15 illus. 3 plates. Univ. of Chicago Press, 1923.

Poison ivy seems to have a special mission for spoiling vacations, and now that vacation time is here, attention turns toward the plant and its menace. Those who are risking infection will want to read about ivy-poisoning, its prevention and cure in James B. McNair's book.

Mr. McNair has set forth facts about poison ivy which may save the vacationist infinite discomfort. He has made identification of the plant easy, has told how to avoid infection, and how best to effect a cure. Contrary to popular opinion, the poison is not carried by the air or the pollen, but is held in the sap, coming to the surface only when the plant is injured. To avoid touching the plant is, therefore, the best preventative, but the poison may reach the susceptible person by way of intermediate agents.

As a complete preventative, McNair advises washing the exposed surface of the body with a solution of 5 per cent iron chloride in 50 per cent alcohol and water. This application will render harmless any ivy poison it touches; prevents the action of the poison before it enters the skin, and stops its spread from one part of the body to another. This substance was known to alchemists hundreds of years ago. It was used as a remedy for poison ivy in 1885, and by 1895 was known to act chemically on the poison.

This substance will work no miracle; its application will not immediately heal ivy-blistered skin. The injury caused by the poison is similar to a burn, and will not heal in a day. As the Great War has shown, the best remedy for burns is paraffin, and it is this substance that McNair has found most effective in stopping the pain and assisting in the repair of ivy-blistered skin. Vacationists who wish to avoid having their vacation ruined by the ivy plant will do well to include some iron-chloride mixture and a few paraffin candles in their kits. But before they start, let them read "Rhus Dermatitis!"

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ORIGINAL ARTICLES

CLINICAL FEATURES OF CORONARY SCLEROSIS*

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The correlation of clinical data and necropsy findings in cases of coronary sclerosis permits a definite classification of clinical types. The following data are based on eighty-six necropsies disclosing coronary sclerosis.

GROUP 1. TYPICAL ANGINA PECTORIS

Typical angina pectoris occurred in 24 per cent of the cases. This type includes cases in which attacks of retrosternal pain are induced by cardiac overload and in which variable radiations of pain occur. There may be a sense of impending death associated with the attacks. The seizures are usually of short duration, are invariably relieved by immobility, and by the administration of nitrites. The average coronary sclerosis in this group was very marked (3+), and in 66 per cent of the cases some of the vessels had become definitely occluded. In 14 per cent of the cases, myocardial infarction had occurred. Besides coronary sclerosis, 19 per cent of the patients had syphilitic aortitis, and one patient had an aneurysm, about 7 by 9 cm., and saccular in form, just above the orifice of the left coronary, and another patient had a diffuse aneurysm of the arch.

GROUP 2. ATYPICAL ANGINA PECTORIS

By atypical angina pectoris is meant a syndrome consisting of attacks of pain induced by cardiac overload and usually located in the upper abdomen, with a variable radiation of pain, and in other respects resembling the typical syndrome. These symptoms very often lead to confusion with surgical diseases of the abdomen requiring surgical treatment. Atypical angina pectoris occurred in

2 per cent of the cases. In one patient the degree of coronary sclerosis was extremely marked, and one of the coronary orifices was almost completely obliterated by an advanced syphilitic aortitis. One patient had a moderate degree (2) of coronary sclerosis, with slight atheroma, and distinct calcareous changes at the root of the aorta and the aortic valves.

GROUP 3. PROGRESSIVE MYOCARDIAL FAILURE

Cases in this group, in which painful attacks are absent, are characterized by symptoms of a failing myocardium. This syndrome occurs in about 26 per cent of the cases. The symptoms may vary from dyspnea on effort to the typical clinical picture of heart failure as evidenced by orthopnea, cough, cyanosis and anasarca. A small number of these patients have paroxysmal attacks of dyspnea, often independent of cardiac overload, and their symptoms conform to the clinical entity called "angina pectoris sine dolore" by the old clinicians. The average coronary sclerosis in this group was only moderate (2+), and occlusion occurred in only 23 per cent of the cases. Myocardial infarction was present in 14 per cent of the cases.

GROUP 4. ANGINA PECTORIS AND PROGRESSIVE MYOCARDIAL FAILURE

In the cases in this group the symptoms of a failing myocardium are associated with typical attacks of angina pectoris. The clinical differences between Groups 1 and 3 are so striking as to make the creation of this fourth group desirable. This syndrome occurred in 8 per cent of the cases. The average degree of coronary sclerosis in this group was marked (3+), and the incidence of occlusion quite high (57 per cent). Infarction of the myocardium occurred in only 14 per cent of the cases.

GROUP 5. OCCULT CORONARY SCLEROSIS

It is very significant that, in 40 per cent of the cases coming to necropsy, the diagnosis of coronary sclerosis was not made by the clinician. In carefully reviewing the records of the patients, it was found that there was insufficient subjective or objective evidence of heart disease to establish the diagnosis with the usual clinical methods of

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examination. A large majority of the patients were old, in that period of life when degenerative processes are at work. It is important to appreciate the fact that a considerable degree of coronary sclerosis may exist with relatively little cardiac insufficiency or evidence of organic cardiac disease. It is, therefore, always well to consider the likelihood of occult coronary sclerosis when appraising the physical fitness or the surgical fitness of patients in middle or later life. The greater application of special lines of cardiac investigation, such as electrocardiography, is desirable, as very often graphic signs are detected which center attention at once on the coronary arteries. The average degree of coronary sclerosis was moderate (2) and occlusion occurred in only 15 per cent of the patients, the lowest incidence in any group. There was no instance of coronary embolism. The pathologic findings are significant in that the degree of sclerosis is only moderate, and the tendency for a patent sclerosis exists.

ASSOCIATED PATHOLOGIC FINDINGS

The thoracic aorta was diseased in 99 per cent of the eighty-six cases; there were sclerosis, atheroma and ulceration in 90 per cent, and syphilis in 9 per cent. The abdominal aorta was sclerotic, atheromatous and ulcerated in 21 per cent of the cases, and in one case a non-syphilitic aneurysm was present.

The cardiac valves were involved by sclerosis, fibrosis or atheroma in 50 per cent of the cases, while in one case an acute vegetative tricuspid endocarditis was present. The aortic valves were affected with greatest frequency, and the mitral and tricuspid valves in order of frequency.

There was evidence of myocardial degeneration in all cases; this consisted of fibrosis, fatty degeneration, cloudy swelling, segmentation and fragmentation of the muscle bundles. In two cases there were areas of necrosis, and in one case, brown atrophy. Infarction of the myocardium occurred in 8 per cent of the cases.

Disease of the pericardium was found in 9 per cent of the cases, and consisted of chronic adherent pericarditis in four, chronic fibrinous pericarditis in two, terminal fibrinous pericarditis in one case, and obliterating tuberculous pericarditis in one.

Arteriosclerosis of the peripheral vessels was evident in 70 per cent of the cases, and arteriosclerosis of the kidneys in 37 per cent. Cerebral arteriosclerosis was found in thirteen of the fifteen brains examined.

Nephritis was present in varying degrees in 53 per cent of the cases.

It is interesting to note that there was disease of the gallbladder in 26 per cent of the cases; this increases the difficulty many times in differentiating the atypical type of angina pectoris from disease of the gallbladder. The co-existence of disease of the gallbladder and angina pectoris must always be considered when there is a question of surgical intervention.

The association of hypertension and coronary sclerosis is generally considered a very unfavorable combination, especially in patients subject to attacks of angina pectoris. The added load cast on the heart by a well advanced hypertension is considerable, and obviously enhances fatigue and degenerative changes of the myocardium. The myocardium in the majority of cases of coronary sclerosis is already the seat of disturbances in nutrition, and any added insult undoubtedly increases the rate of progression and the degree of structural damage. Hypertension was present in 31 per cent of the cases in this study; in 43 per cent of the cases of typical angina pectoris; in 55 per cent of the cases of progressive myocardial failure; and in 18 per cent of the cases of occult coronary sclerosis. The average systolic pressure in the whole group was 183, the average diastolic pressure 111, and the average pulse pressure 72.

The frequency of the association of obesity and degenerative cardiovascular disease prompted particular inquiry into this relationship, with special reference to sclerosis of the coronary arteries. The height and weight of forty-nine patients in this study were available, and 29 per cent were distinctly obese.

MODE OF DEATH WITH CORONARY SCLEROSIS

Sudden Death.—The frequency of sudden death in cases of coronary sclerosis has been appreciated for many years. Of the cases reported here, sudden death occurred in 37 per cent. The highest incidence occurred in patients with typical angina pectoris, 33 per cent of the patients dying suddenly. In order of frequency, the other clinical types of coronary sclerosis attended by sudden death were: occult coronary sclerosis, 21 per cent; angina pectoris with progressive myocardial failure, 19 per cent; progressive myocardial failure, 17 per cent, and atypical angina pectoris, 6 per cent. Sudden death in angina pectoris is not unexpected. The

rather high incidence of sudden death in both the progressive myocardial failure type and in the occult type of coronary sclerosis implies the necessity for more accurate diagnosis, and for the identification of the pathologic processes underlying myocardial degeneration.

The average degree of coronary sclerosis was pronounced (3+) and occlusion was evident in 56 per cent of the patients. Seventy-one per cent of the patients with myocardial infarction died suddenly.

Gradual cardiac failure.—Death was the result of gradual cardiac failure in 15 per cent of the cases. The incidence according to clinical types was as follows: typical angina pectoris, 38 per cent; progressive myocardial failure, 38 per cent; occult coronary sclerosis, 14 per cent, and angina pectoris and progressive myocardial failure, 8 per cent.

The average degree of coronary sclerosis in patients who died from gradual cardiac failure was quite advanced (Grade 3), but there was less tendency to occlusion (38 per cent). Myocardial infarction occurred in only 8 per cent of the cases.

Death from other causes.—Causes other than heart disease were responsible for death in 48 per cent of the cases. This group included patients suffering from diseases such as chronic nephritis, cerebral hemorrhage, diabetes mellitus, carcinoma of the stomach, carcinoma of the pancreas, carcinoma of the prostate, and cirrhosis of the liver. The incidence of clinical types in this group is significant, in that 68 per cent of the cases were of the occult coronary sclerosis type. This indicates that the patient's attention is chiefly directed to his major complaint, and that in the physical examination the appraisal of the cardiovascular system is probably not sufficiently thorough. There unquestionably are instances in which the identification of occult coronary sclerosis is impossible, yet every effort should be made to make this group minimal. The other clinical types, in which death resulted from causes other than heart disease, were

the progressive myocardial failure type, 27 per cent, and typical angina pectoris, 5 per cent.

ELECTROCARDIOGRAPHY IN CORONARY SCLEROSIS

The electrocardiogram is of great aid in the diagnosis of coronary sclerosis. The high incidence of certain graphic abnormalities in proved cases of coronary sclerosis makes this a valuable clinical adjunct, and the more routine application of electrocardiography in cases in which coronary sclerosis is likely to exist will aid materially in the identification of the occult or unrecognized type. The most frequent graphic abnormality present is the inversion or negativity of the ventricular T wave in certain isolated or combined derivations.^{2, 5}

In this study, of the patients receiving electrocardiographic examination, 68 per cent showed significant graphic abnormalities. In a previous study³ of 155 cases of angina pectoris, significant electrocardiographic changes were found in 51 per cent.¹ There is little doubt that the use of the electrocardiograph in conjunction with careful clinical study is of great help in identifying obscure cases of coronary disease.

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Salvarols and Insulols.—Salvarols are stated by the Drug Products Company to be rectal suppositories containing arsphenamin. The lack of evidence for the value of the rectal administration of arsphenamin was the subject of a report of the Council on Pharmacy and Chemistry in 1920, and the Council's conclusions have been fully confirmed. Insulols are stated by the Drug Products Company to be suppositories made "with carefully selected desiccated pan-

creas including the islands of Langerhans containing insulin in a safe and reliable form." The rectal administration of insulin has been tried, but without success. No preparation of the Drug Products Company has been admitted to New and Non-official Remedies. On the other hand, the Council on Pharmacy and Chemistry has reported unfavorably on the firm's "Pulvoids Calcylates," "Pulvoids Calcylates Compound" and "Pulvoids Natrium Compound" (*Jour. A. M. A.*, July 26, 1924, p. 289).

RADIUM IN BENIGN CONDITIONS OF THE NOSE AND THROAT *

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In presenting the subject of radium in benign conditions of the nose and throat I am not unmindful of the fact that considerable controversy and confusion as to the value of radium exists in the minds of a large number of our profession. A few preliminary words about radium and the why of this confusion may not be out of place.

A little over twenty-four years have passed since radium was first introduced as a therapeutic measure. A great deal has been written about radium, especially of its use in malignancy and the results in the latter have not been as satisfactory as at first hoped. It is gratifying to find that radium is proving eminently satisfactory in many benign lesions and that it has a decided field of usefulness in rhinolaryngology.

For over three years the writer has been engaged in making a review of the literature of the last twenty years as it relates to the use of radium in the field of oto-rhino-laryngology and ophthalmology, and has also studied considerable other radium literature with reference to the properties of radium, methods of its application, its uses and the results both in malign and benign lesions.

The work and results of many experienced radium workers have been observed from time to time and personal work with radium for more than two years together with the data gathered from the above studies convinces the essayist that much of this misunderstanding has resulted from the following facts.

At first some of the earlier work was done with preparations of doubtful strength. For example, one eminent authority, who has done considerable radium work about the head, after using radium for nearly ten years with more or less unsatisfactory results, found his preparation contained only a small amount of real radium and not sufficient for malignant work.

Second, knowledge of the properties of the different rays, of screening and of the best methods of using radium, until quite recently, was often hazy in the minds of some of its users. One states

that the gamma rays from a 50 mg. quantity have little power of penetration. We now know that the gamma rays in general are many times (some estimate one hundred times) more penetrating than the other rays.

Third and perhaps the most unfortunate is the fact that radium has been used and exploited by some who were ill prepared to use it scientifically and successfully. Consequently it has been tried in many conditions totally unsuited to its use as well as being improperly used. What else but failure and disappointment could result under such circumstances?

Thanks to the painstaking efforts and observations of many experienced radium workers, this form of therapy is to-day on a securer foundation than ever before. Pardon me if these opening remarks have seemed a trifle tiresome but prejudice and pessimism instead of an open mind, especially among those who have had no personal experience in using radium, is all too common and lead us nowhere.

Turning to the field of rhinolaryngology we find radium of benefit in the following benign conditions and diseases.

GROUP I

BENIGN LESIONS OF THE NOSE IN WHICH RADIUM HAS PROVED OF VALUE

1. Angioma.
2. Chronic rhinitis.
3. Fibroma—nasopharyngeal.
4. Hay fever.
5. Hyperplastic conditions.
6. Polypi.
7. Postoperative ethmoid and sphenoid conditions.
8. Rhinophyma.
9. Rhinoscleroma.
10. Syphilitic lesions.

Radium is a specific in angioma, whether of the nose, throat or other portions of the body. Crowe¹ considers angioma of the nose more frequent than the textbooks would have us believe. He says the results with radium are very good but may be a little slow.

Aitkins² reports favorable results in several cases of chronic rhinitis, particularly an intractable case with infection of the vibrissæ and upper lip as well as the nasal mucosa. These are difficult cases to treat and we welcome a remedy which gives

*Read before the Southern Minnesota Medical Association, Mankato, May, 1924.

prompt relief. Several have had success in treating naso-pharyngeal fibromas. These growths are unsatisfactory to treat surgically on account of hemorrhage and recurrence. Radium fails occasionally to remove completely very large fibromas. Park³ reports success with the use of emanation in hay fever. To get the best results radium must be used early before the hay fever season begins.

Shea⁴ had found radium of considerable value in treating postoperative ethmoid and sphenoid lesions and in hyperplastic conditions. It stimulates healing and prevents troublesome granulations. The essayist has confirmed Shea's experience and has yet to find any remedy which so effectively and speedily relieves the severe headaches and neuralgias which accompany sphenoid disease. Thirty to 50 mg., well screened, are used from two to three hours once in seven to fourteen days as indicated.

Polypi have yielded excellent results with radium. Much credit is due to Lyons⁵ for his work in this field. While radium does not cure every case of polyps, it produces a fibrosis in the myxomatous type so that surgical procedures are rendered more effective. Lyons states, "Definite operative cures occur more often with radium than without." While the writer's experience is not large, four cases have remained free from return and troublesome symptoms for more than a year, and several other cases of a shorter duration appear to have been greatly improved. Sluder⁶ has recently reported benefit from the use of radium in nasal polyps. Fifty mg., using a silver, gold or platinum screen with rubber, may be left in situ for two to three hours at intervals of once a week for three to four sittings and repeated if needed.

Several reports of the treatment of rhinophyma and rhinoscleroma were found. Syphilitic lesions of the nose which failed to respond to anti-syphilitic treatment cleared with radium. The rhinologist is frequently consulted for certain skin lesions of the nose such as nevi, lupus erythematosus, eczema, ulcers, and occasionally blastomycosis lesions of the lids extending onto the nose. In all these conditions radium is of decided value.

GROUP II

BENIGN CONDITIONS OF THE THROAT IN WHICH RADIUM HAS PROVED OF VALUE

1. Angioma of larynx.
2. Angioma-like masses at base of tongue.

3. Benign papilloma of larynx.
4. Hyperplastic conditions of the larynx.
5. Chronic pharyngitis.
6. Follicular tonsillitis.
7. Hypertrophied tonsils.
8. Hypertrophied lingual tonsils.
9. Tuberculous tonsils.
10. Vincent's angina.

OTHER CONDITIONS OF THE HEAD AND NECK OCCASIONALLY ASSOCIATED WITH DISEASE OF THE NOSE AND THROAT

1. Tuberculous glands.
2. Tuberculous sinuses.
3. Pituitary lesions.
4. Thrush.
5. Actinomycosis.
6. Leukoplakia.

Angioma of the larynx is rare. New⁷ reports three cases where radium was of benefit. The large masses of angioma-like vessels or varices found at the base of the tongue may be entirely and easily removed by the application of radium.

Radium is a specific in papilloma of the larynx. American laryngology owes much to Abbe⁸ who discovered that radium would permanently cure papillomata. Many reports of brilliant results are found in the literature, the one of New⁹ being the largest and most complete. In very extensive papillomas a tracheotomy is required and the radium is inserted through this opening into the papilloma. External radiation may be combined with the intralaryngeal application when the papilloma interferes with a laryngoscopy.

Radiation must be evenly distributed. Doses of 25 mg. in a silver or platinum capsule unfiltered except for rubber have been used for one and a half hours with good results. This dose is repeated once a month for two or three times. Larger doses of 50 to 100 mc. of emanation with a silver screen and rubber used for twenty to thirty minutes and repeated in six weeks for two or three times have been very effectual.

Hyperplastic conditions including tuberculosis of the larynx have responded well to radium therapy. Freudenthal¹⁰ and others have reported good results in tuberculosis of the larynx; the former reports a series of ten cases using a 10 mg. aluminum capsule. The writer has used a small 15 mg. platinum needle unscreened except for rubber for half an hour to one hour, repeating the dose once a month

for five doses in a case of hyperplasia and edema of the larynx. Excellent results were obtained. (Case 1.)

Chronic pharyngitis with large dilated vessels and lymphoid masses will respond to radium. Crowe¹ of Johns Hopkins, in a recent article, states, "We believe it would be a wise precaution to treat with radium every adult patient that has a localized hypertrophy of the lymphoid tissue limited to the nasopharynx, rather than to remove it with the curet."

By far the larger number of cases of the nose and throat treated with radium are those of the tonsil. Several report success in treating tuberculous tonsils, the lung process being delayed and the general condition improved. Large lingual tonsils are reduced easily and much more satisfactorily than by surgery. Leukoplakia of the tonsil and mouth has been cured by radium.

More than 500 cases of hypertrophied and pathologic tonsils treated with radium were compiled from the literature. In addition there were several writers who did not report the exact number of cases they had treated, but simply stated they had used radium successfully many times. In 200 cases, the work of two authors, only eight cases or 4 per cent were not reduced or unsatisfactory.

Robinson¹¹ reports the largest series, 156 cases, with but five unsatisfactory results. Neuritis of long standing was cured. Marked remission of symptoms and improvement in chronic catarrhal otitis media were noted.

Williams,¹² who is highly trained, experienced and a conservative worker, reports a series of 101 cases, ranging in age from five to sixty years. He found recurrence of tonsillitis prevented, enlarged glands reduced, arthritis improved and the method satisfactory in 93 per cent of his cases (followed two years).

Acutely inflamed tonsils seem to respond quicker to radium. This has been observed by several and a case to illustrate this point is given (Case 2). There are a few other conditions about the head and neck which the rhino-laryngologist occasionally meets with where radium has proved of value. Tuberculous glands often associated with tuberculous tonsils, likewise cervical adenitis associated with pathologic tonsils, respond well in 90 per cent of the cases. The essayist has found radium of use in closing a stubborn tuberculous sinus of the neck.

Pituitary lesions associated with sphenoid disease, hyperplasia and other conditions have been found to be benefited by radium combined with the roentgen ray. Actinomycosis of the tonsil and glands has been successfully treated with radium.

CONSIDERATIONS IN THE USE OF RADIUM IN TREATING PATHOLOGIC TONSILS

The use of radium in producing an atrophy of the tonsil is founded on sound biologic principles. The tonsil is largely composed of lymphoid tissue. It has been known for years that this type of tissue is very susceptible to the action of radium and the roentgen ray. That radium produces an atrophy has been shown by Wells.¹³ Two years ago the essayist removed a piece of tonsil tissue from a patient who had had three 25 mg. doses of radium and found microscopic evidences of definite areas of atrophy and fibrosis in many of the follicles.

It has been seen from the reports of those who have had considerable experience with this form of therapy that symptoms are relieved, the treatments are painless and without untoward effect when properly given. Complete atrophy can be obtained if the treatment is sufficiently carried out. This form of therapy is suited to the treatment of simple hypertrophied tonsils and adenoids of children, with patients suffering from heart disease, chorea, hemophilia, tuberculosis and other debilitating diseases where operation is contraindicated.

The writer considers that radium is contraindicated in patients with the following tonsil conditions and operation is indicated:

1. History of repeated attacks of tonsillitis and peritonsillar abscess.
2. Small, firm, sclerosed, submerged tonsils with history of frequent sore throats.
3. Badly infected tonsils causing acute poly-arthritis, acute kidney, certain eye lesions and other definite evidences of infection.
4. Cases of rapidly increasing deafness and ear infection clearly due to diseased tonsils and adenoids.

REPORT OF TONSIL AND OTHER CASES

Fifty patients ranging in age from four to sixty-three years are herewith reported. The majority have been observed from one and a half to over two years; no case is reported which has not been followed at least one year. All but five were re-examined or communicated with within the past thirty days.

RESULTS ONE TO TWO OR MORE YEARS AFTER

TREATMENT

	Number	No Return of Symp- toms	Im- proved	Unsatis- factory
Total number	50	33	14	3
Untraced	1	..	..	1
Hypertrophied type	44	27	..	..
Small type	6	6	..	..
Tonsillitis	19	18	..	1
Sore throat	22	18	3	1
Frequent colds	21	18	3	..
Enlarged glands	20	18	2	..
Acute and chronic ear con- ditions	14	12	2	..
Arthritis	8	7	1	..
Chorea	1	1	..	..
Nervous	4	3	1	..
Radium used with x-ray of glands	6	5	1	..

Many patients have gained in weight. Improvement in breathing and greater freedom from frequent colds have been noted. Glandular enlargements have been reduced. Six patients with extensive glandular involvement and many follicles on the pharynx were treated with the roentgen ray in addition to the radium. One patient has had a tonsillectomy. This patient had very large tonsils, several abscessed teeth, and took but one treatment. The tonsils were considerably reduced and the tonsillectomy was not done for many months after the treatment when the teeth gave trouble.

A severe case of chorea (Case 3) responded remarkably well. Several patients with acute follicular tonsillitis obtained almost immediate relief. A patient with a Vincent's angina of two weeks' duration which had not responded to previous treatment was entirely healed on the fifth day after a 40 mg. dose.

Considerable care has been used in selecting patients for radium therapy. Special attention has been paid to the diet and removing other foci of infection. Of the fourteen cases classed as improved six consider their condition satisfactory. Nine of the fourteen have had only one treatment to each tonsil, which was not at the time deemed sufficient; likewise several of those having no return of symptoms. In four of the improved and two of the unsatisfactory, diet and home environment are still very faulty. Many show throats cleaner, smoother and freer from remnants and scarring than is seen oftentimes following tonsillectomy.

In 1922 the essayist presented a report¹⁴ of a somewhat similar group of patients treated with

the roentgen ray. A review of these cases has been made. Not nearly so many could be traced or re-examined as in this study. The results on the whole have been less satisfactory than with the radium. Radium has the advantage of being placed where it is needed, namely, within the tonsil. It causes a much more uniform reduction and without any unpleasant symptoms. No burns or other untoward effects have been noted in the radium therapy of any nose or throat patient.

Case 1.—Edema and hyperplasia of larynx. A. M., a man, aged 27, was seen October 13, 1922. He complained of hoarseness and dyspnea of three years' duration; also of an ozena of many years' duration. He had no pain. He gave a history of having been under observation for a tuberculosis of the lungs for several years, but at that time it was inactive.

Examination: The patient is a well developed slightly obese man. He has an extensive ozena of the left nostril with a lesser involvement of the right one. Some dental caries is present; also a chronic pharyngitis. Some tonsil tissue is left in each fossa. There is no glandular involvement. Examination of the larynx shows the arytenoid tissues much thickened and edematous. The vocal cords are not visible, being hidden by the enlarged ventricular bands. No evidence of ulceration is present. The epiglottis is not involved.

The Wassermann is negative. The basal metabolism is a minus 7 per cent. Report of the x-ray and chest examination shows an apparently healed lesion. The heart and other findings are negative.

Treatment: A small 15 mg. platinum needle, unscreened except with two thicknesses of rubber, held in place by a silver wire, was introduced over the arytenoid area for a half hour. Its position was frequently changed. No reaction followed the application and one month later the dose was repeated for one hour. Treatment was prescribed for the ozena. As a result the hyperplasia became markedly decreased, the vocal cords were easily seen, and the edema entirely disappeared. The hoarseness and dyspnea were greatly relieved. The patient's condition has remained good to date.

Case 2.—Acute follicular tonsillitis. Mrs. S. D., aged 38, was first seen in January, 1914. The previous week she had had a severe attack of tonsillitis. Examination showed a large left inflamed bulging tonsil with a peritonsillar abscess. This was drained and treated. On the eighth day, when about recovered, she had a spontaneous hemorrhage from the center of the left tonsil. This bleeding persisted at intervals for a period of three days in spite of every effort to control it.

In 1915 she had another attack with evidences of focal infection from the tonsils. Operation was advised after recovery. In 1916 she was seen again with a peritonsillar involvement. A short time after she moved away and was not seen again until January, 1922. She gave a history of several attacks of tonsillitis since last seen. There was present on this date a severe follicular tonsillitis with tem-

perature of 102. A 10 mg. platinum needle was embedded in the left tonsil for three hours. The other was painted with 25 per cent silver nitrate. The following morning the left tonsil was very much cleaner and the swelling and inflammation decidedly less than on the right side. The temperature was 99. A similar dose was then used on the right tonsil. Improvement was rapid. The patient reported relief from pain, from difficulty in swallowing and less aching than with any other form of treatment she had ever had during an acute attack of tonsillitis.

An additional dose of 50 mg. was used a few weeks later in each tonsil. Up to May, 1924, this patient has not had a sore throat or cold since the first treatment. She has gained considerably in weight, and her rheumatism and tired feeling have entirely disappeared. The tonsils before treatment extended two-thirds the distance to the uvula. They now are well within the pillar line, the surfaces are clean and no pus can be expressed. Another treatment was advised in order to bring about the entire disappearance of the tonsillar tissue. The patient, however, considers this unnecessary while her present condition is so satisfactory.

Case 3.—Chorea. E. P., aged 6. She had been excluded from school in 1922 on account of a severe chorea. She had had an attack of tonsillitis in December, 1922. Examination showed some cervical enlargement; the tonsils extended more than half way to the uvula, were inflamed and ragged. She was very nervous and had a typical chorea. This child was undernourished and finicky about eating. She weighed fifty pounds. She had had many earaches but no suppuration.

On January 3, 1923, the right tonsil was embedded with a 15 mg. needle for three hours. She was put on a rigid diet containing plenty of vitamins and more rest was prescribed. On January 16 the left tonsil was treated in a similar manner. On January 27 she was better and on February 10 she was able to return to school for short sessions. She had gained several pounds and her chorea was not noticeable unless she became overtired.

In March both tonsils were again treated by the same method. Her heart action was better and her general condition much improved. On April 18 her chorea was entirely gone, the tonsils were scarcely visible and she was in school full time. May 1, 1924, she had had no colds or sore throat since the treatments began. There had been no earache, and the nervousness and chorea had entirely disappeared. There was no cervical enlargement. She had gained eleven pounds and was in excellent condition. The tonsil fossæ were clean.

GENERAL CONSIDERATIONS IN THE USE OF RADIUM IN THE NOSE AND THROAT

A thorough knowledge of radium, of proper dosage and screening is absolutely essential to its successful use. Radiation must be evenly distributed to get the best results. Great harm can be done with radium if not properly applied. No untoward effects in benign lesions have been noted when radium was carefully used.

Extreme care must be taken in selecting cases, particularly in tonsil work, so that discredit may not be given this form of therapy. The tendency seems to be to use filtered rays with smaller doses and more frequent application, thereby securing better results.

Mottram¹⁵ and others have shown that radium if long continued or used in large doses produces a condition identically similar to an avitaminosis. Therefore attention must be paid to the physical condition and diet of patients undergoing radium therapy.

Judgment and experience are necessary in using radium. It is no longer an entirely experimental agent and it offers valuable possibilities in experienced hands in bringing relief in many troublesome conditions of the nose and throat. Dosage can now be estimated almost as accurately as with any ordinary drug. Painstaking observations are essential in creating a wider field of usefulness in radium therapy in rhinolaryngology.

ADVANTAGES OF RADIUM

Radium possesses many advantages over the roentgen ray in the treatment of benign conditions of the nose and throat. It has the advantage of being applied directly to the lesion without harm to the surrounding normal tissues.

Freedom from pain, less loss of time from work, and avoidance of scarring characterize the use of radium in the majority of nose and throat cases. Uniformly good results without danger and accident incident to surgery and anesthetics about the head make radium a highly desirable form of therapy in many lesions.

SUMMARY

1. Radium is of distinct value in many benign lesions of the nose and throat.
2. It is a specific in papilloma of the larynx and in angiomas of the nose and throat. It gives promise of being of considerable value in the treatment of nasal polyps.
3. Lymphoid hyperplasias of the throat and nose yield quickly to radium since lymphoid tissue is very radio-sensitive.
4. Radium is of value in treating pathologic tonsils of patients suffering with heart disease, chorea, hemophilia, tuberculosis, other debilitating conditions and in the simple hypertrophied tonsils of children.
5. Radium offers less scarring, less loss of time

from work and more slightly results than surgery in many conditions about the head.

6. Every unnecessary operation does some harm to medical science.

7. A thorough knowledge of radium, its effects, and methods of application is essential to its successful use in nose and throat work.

8. Much remains to be learned about the type of lesions best suited to radium therapy. Pains-taking observation of cases and more uniform methods of reporting technic and results is highly to be desired in the field of rhino-laryngology.

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DISCUSSION

DR. B. E. HEMPSTEAD, Rochester: Dr. Lane has given us a paper which I consider to be very timely. For a long time, radium has been considered of use in only malignant conditions. Recent work of many men has proven that its greatest usefulness is in some benign conditions. In the Clinic, it has been used in angiomas, nasopharyngeal fibromas, rhinoscleromas, papillomas of the larynx, leukoplasias, actinomycosis, thrush, and nasal polyps. The very extensive experience of New has shown that it is specific in angiomas, papillomas of the larynx, and nasopharyngeal fibromas. He also advised the use in actinomycosis, but merely for the purpose of breaking down the mass. We have not used it in acute infections nor in tonsil work unless the case is a malignant one.

A word of warning must be given. Radium should be used only by competent people, since burns and sloughs may occur from its improper use. It may be used either in the form of the salt, the emanations in tubes, or the emanations in seeds. A thorough knowledge of each is necessary.

HYPERTENSION: AN INDEX TO THE TOXEMIA OF PREGNANCY*

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and

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The toxemia occurring in the later months of pregnancy may be ultimately manifested by eclampsia, which claims for its victims 25 per cent of the women who die yearly as a result of childbirth. Vogeler, in 1907, directed attention to the importance of watching closely the pregnant woman with increasing hypertension for symptoms of impending eclampsia. Since his observations, a great deal of attention has been paid to blood-pressure readings during pregnancy, and much has been written on hypertension in the toxemias of pregnancy. Adair, in 1923, reviewed the literature and cited examples of the various types. Routine interval blood pressure readings, beginning early in pregnancy, have come to be regarded by many observers as of equal, if not of greater, importance than routine urinalyses for albumin.

Routine monthly blood-pressure readings give one the impression that during the early months of pregnancy the blood pressure of many patients is subnormal (below 120), and that there frequently is a gradual rise during pregnancy. In this review of 523 cases of pregnancy, a pressure of 140 mm. of mercury or more was considered as definite evidence of hypertension. In most cases, readings were made over a period of several months, usually from the third month on. In all cases, the urine was tested for albumin. One hundred four of the 523 patients had at some time during their pregnancy, a systolic pressure of 140 or more (Figs. 1 to 4).

Figure 1 shows the curve of the incidence of pregnancy according to the age of patients; over 55 per cent occurred between the ages of twenty-five and thirty-five years. This is given for contrast with the curve showing that in this decade the percentage of patients having hypertension was lowest.

Figure 2 shows the number of patients having hypertension, according to their parity. It is of interest that more than 27 per cent of patients in

*Read before the Southern Minnesota Medical Association, Mankato, May, 1924.

the Para I group had hypertension, the percentage dropping steadily to about 5 in the Para V group, and rising rather abruptly in the Para VI (and over) group. This abrupt rise is apparently due

associated with toxemia, (2) hypertension resulting from chronic nephritis, and (3) the so-called essential hypertension.

Under this classification hypertension is of more significance in some cases than in others. In each case it is necessary to determine the cause of the hypertension relatively early. The non-pregnant woman rarely has essential hypertension before the fourth decade of life. In the pregnant woman it is not accompanied by an appreciable amount of albumin in the urine, nor by the usual symptoms of toxemia; that is, edema, headaches, dizziness and abdominal pain.

It may be difficult to differentiate chronic nephritis. In a mild case in the early months of pregnancy the woman may have normal blood pressure and no urinary abnormality, aside possibly from a low specific gravity which points toward pre-existing nephritis. Occasionally there will be a history or record of acute nephritis, or of symptoms of toxemia during a previous pregnancy. Study of the ocular fundi may reveal evidence of old trouble.

The differential diagnosis may only be made later in pregnancy when, besides the toxic symptoms, evidence is found of lowered phenolsulphonphthalein output in the urine, and retention of

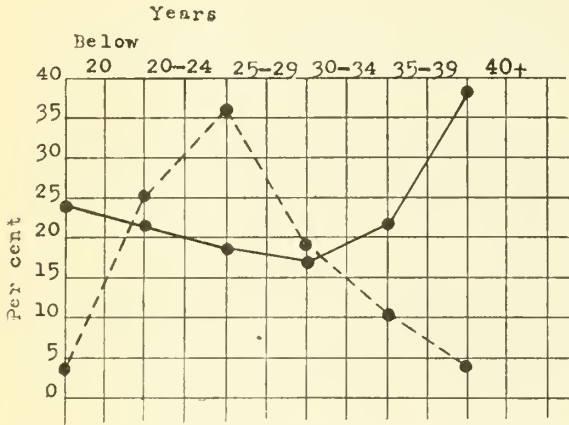


Fig. 1. The dash line represents the incidence (per cent) of pregnancy according to age, and the heavy line, patients (per cent) according to age, with systolic blood pressure over 140.

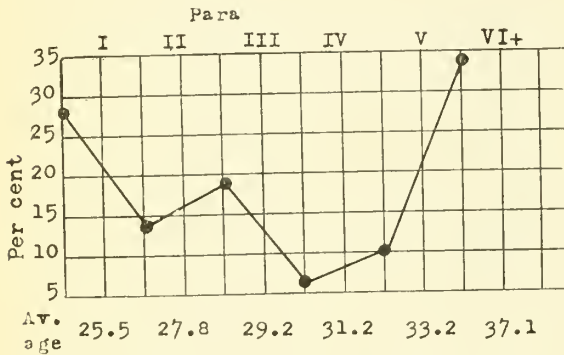


Fig. 2. Percentage of patients with systolic blood pressure over 140 according to parity.

to the increasing incidence of chronic vascular disease in the older patients.

In Figure 3 is shown the finding with regard to albumin in the urine, which may or may not be of importance. A faint trace, which is of no significance, was found in 123 patients without hypertension. A patient may have a marked amount of albumin in the urine without any rise in blood pressure or other evidence of toxemia. This may be due to pyelitis and, more rarely, to the nephrosis of pregnancy. More or less albumin was found in 50 per cent of the entire group; only 50 per cent of patients with hypertension had more than a faint trace of albumin. This bears out Litzenberg's findings in 1917.

De Snoo, in 1922, divided the hypertension of pregnancy into three groups: (1) hypertension

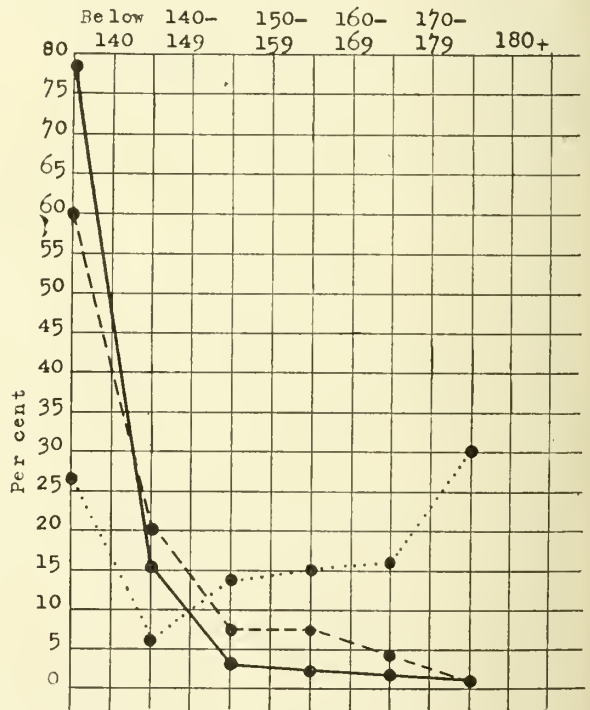


Fig. 3. Relation of albumin in urine to hypertension. Albumin 1, heavy line; albumin 2, dash line; albumin 3 and 4, dotted line.

urea in the blood. One of the peculiar phases of the toxemia of pregnancy is the lack of evidence of renal deficiency aside from chloride retention. In this it closely resembles "trench nephritis" (acute glomerular nephritis). In fact, Keith asserts that the symptoms and findings of so-called eclampsia may be identical with the convulsive type of trench nephritis. The differential diagnosis is most important on account of treatment and prognosis. Although essential hypertension must be carefully watched it does not carry a bad prognosis. The prognosis of toxemia is good if the early symptoms are relieved and eclampsia is avoided, but the prognosis in cases of chronic nephritis is usually poor.

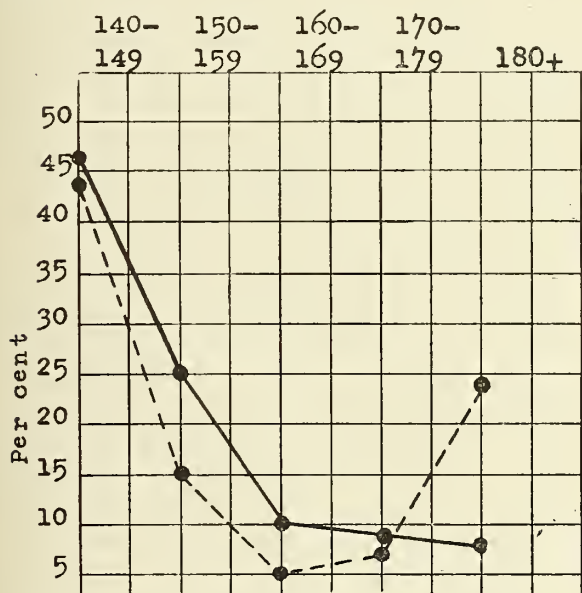


Fig. 4. Heavy line represents patients below thirty years of age, and the dash line patients above thirty years of age, showing the incidence of various grades of hypertension (per cent).

Of the 104 patients with hypertension, sixty-one had varying grades of toxemia, ten had essential hypertension, and ten had chronic nephritis. Of the remaining twenty-three, many of whom had a pressure between 140 and 150, the data were insufficient for diagnosis. Most of these were examined for the first time shortly before or during labor, and had only one blood-pressure reading.

A review of the eighty-one cases of hypertension in which diagnosis was possible tends to bear out the hypertension curve according to age and parity, as shown in Figures 1 and 2. Of the patients with hypertension below the age of thirty, 72 per cent had toxemia, while 54 per cent of those with hyper-

tension over the age of thirty, had toxemia; 67 per cent of the patients with toxemia were Para I, while only about 40 per cent of the entire group were Para I. It is not uncommon to carry through subsequent normal pregnancies a patient who, in her first pregnancy, had hypertension with definite evidence of toxemia. Figure 4 shows that patients over thirty years of age have the more severe grades of hypertension, due mainly to the higher incidence of chronic vascular disease in the older woman.

CONCLUSIONS

1. Increasing hypertension during the course of pregnancy at any age points toward the onset of toxic symptoms.
2. Hypertension, especially in the woman under thirty years of age, is a better index of early toxemia than is albuminuria.
3. Toxemia of the later months of pregnancy is most common in primiparous women.
4. The evidence that more than 25 per cent of primiparous women have a blood pressure over 140, and that this hypertension is a fair index of the onset of toxemia, emphasizes the importance of blood-pressure readings at regular intervals as a routine of prenatal care.

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DISCUSSION

DR. W. H. CONdit, Minneapolis: Dr. Mussey's excellent study of his series of five hundred cases of pregnancy, relative to the frequency of toxemia, presented to us today, is of unusual interest and demonstrates, as do all carefully analyzed statistics, that the curve of incidence of toxemias of pregnancy is upward, in spite of the general improvement shown by the records of our maternity hospitals.

I was pleased to see Dr. Mussey place the danger mark in the hypertension of pregnancy at 140 systolic. In 1914 I presented an essay before the Cook County Medical Society in Chicago, entitled, "Some Medical and Surgical Problems of Prophylaxis in Eclampsia" and suggested the danger line be placed at 150 systolic pressure.

I also suggested that we discontinue the use of the word

"eclampsia" as it is not a descriptive work. Its derivation is from a Greek word meaning "to flash"—"to shine out brightly"—and is more properly "eclactma" not "eclampsia." Surely there is nothing very bright or shining about the convulsions in toxemia of pregnancy. A better term to use to designate the cases usually called eclampsia is "toxemia with convulsions" or "without convulsions" as the case may be.

The doctor's essay quite forcibly illustrates another debated point in obstetrics, namely that a pregnant woman is in a pathological rather than a changed physiological state. In 1922, ten per cent of the women in this state giving birth to a living child were unattended and unadvised by a licensed physician and forty per cent of these 5,600 women were not even attended by a midwife or nurse. This condition surely demonstrates the need of more education of the public to the necessity of some supervision of all patients in the pregnant state. Again, so long as licensed physicians, irrespective of their obstetrical training, continue advising and delivering the pregnant women, we still have work to do in our profession to improve the service before the mortality and morbidity statistics of pregnancy are improved.

I feel that careful, accurate and conscientious study of the blood tension in pregnancy is the best means so far known to our profession for determining the first signs of toxemia and that any patient so studied can be so treated as to be always protected from the dangers attending toxemias of pregnancy.

SHOULD WE DRINK ICE WATER?

The American habit of drinking ice water is not viewed with alarm by Dr. James Frederick Rogers, writing in the August *Hygeia*, popular health magazine. Dr. Rogers thinks that physicians of a generation or two ago were unduly concerned over the harmful effects of ice water on the stomach.

In some instances harm may be traced to the practice, Dr. Rogers declares, but many persons experience no injurious effects whatever. It does cool the stomach and inhibit digestion but this effect is less than is commonly supposed. Most of the deaths that were formerly attributed to drinking ice water were simply due to heat.

To test out the effects of ice water upon workers exposed to high temperatures, the American Society of Heating and Ventilating Engineers recently carried out some experiments. After being an hour in very hot surroundings, two men drank a quart of ice water in less than fifteen minutes. Cramps did not develop and they experienced no ill effects.

"Most of us can certainly take a moderate amount of at least moderately cold water without harm," concludes Dr. Rogers, "and in hot weather even a larger number can indulge in a reasonable quantity of cold beverages without fear either of deadly effects or even a passing digestive disturbance. In this, as in many other every-day matters connected with our bodily affairs, each man is the best judge of what is good and what is harmful for himself."

THE X-RAY IN OBSTETRICS*

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Roentgenography has already begun to spread its rays of usefulness into the field of obstetrics and, although still in its embryologic stage, gives promise of being as indispensable here in the near future as it now is in all the other branches of medicine and surgery.

During the past eighteen months the writer has been interested in the study of this particular work. At first, roentgenograms were made only in those cases in which some abnormal condition existed or was being suspected. As more of these pictures were taken and closer observations made, it soon became obvious that there was considerable more to be learned than had at first been anticipated. At the present time the x-ray is used in all primiparous patients routinely and in multipara only when some indication presents itself.

Considerable discussion has been created with regard to the effect of the x-ray upon the babe in utero. The consensus of opinion at the present time is that the x-ray can do no harm either early or late in pregnancy. There are some men, however, who contend that repeated exposures during the early months of pregnancy may be sufficient to cause an abortion. There appears to be no opposition to the employment of the x-ray in the last trimester of gestation.

As to the time most suitable for x-raying these patients, it is advisable to wait until the last month of pregnancy; within two to three weeks of the probable date of confinement. The reason for this is threefold: (1) because then the baby is almost completely developed; so that the findings at this time are very apt to persist and to be present when the patient goes into labor; (2) the bony skeleton is more completely ossified, and, therefore, gives a much clearer picture; (3) the cases may be followed from time to time; diagnoses made; findings recorded and then the x-ray used, not as a sole means of diagnosis, but as an aid in checking up these findings and to correct any errors which may have been made.

Of what value is the roentgen-ray in obstetrics?

*Presented before the staff of St. John's Hospital on January 21, 1924.

How may we expect to benefit by its use as an occasional or routine measure in the practice of obstetrics? From my own short experience and from a survey of some of the literature already available upon this subject, I am convinced that by the aid of the *x*-ray one may determine: (1) normal or abnormal relative proportions; (2) the presence of a single or multiple pregnancy; (3) position and presentation; (4) the presence of a monstrosity, e.g., a hydrocephalic, an anencephalic, a double monster, etc.; (5) the presence of a dead baby; (6) the diagnosis of pregnancy.

Relative proportion has been placed at the head of this list because it is one of the most important things to know before labor sets in. An effort is usually made to determine this prenatally, by the aid of the pelvimeter; but while this method is fairly accurate, it does not give all the data necessary for the correct diagnosis of proportion. Too often do patients with apparently normal measurements have prolonged, difficult labors, many times demanding instrumental delivery and occasionally abdominal section. It is therefore important to know not only the size of a pelvis but also the size of the head which must pass through it. An abnormally large head will not pass a pelvic cavity even though the measurements are found normal; while a small head may pass a comparatively small pelvis. The *x*-ray enables us to determine this with the greatest possible degree of accuracy.

The importance of determining whether a mother is carrying more than one baby is self evident. The mother is anxious to know—and should know—whether she is going to have twins in order that she may be prepared for that eventuality, and be less surprised when it is all over. Again, in a patient with a small pelvis, who is carrying twins, the diagnosis of a single large baby may be made; and in order to make her labor less difficult, one may desire to induce labor two to four weeks before the probable date of confinement. In the presence of a single baby, where it is feared that a continuation of the pregnancy for two to four weeks may give rise to disproportion and a subsequent difficult labor, this may be a justifiable procedure, but in the presence of twins which as a rule are already premature, it may mean death to one or both babies.

While it is true that positions and presentations very often change during the last month of pregnancy, still in the vast majority of cases the find-

ings are much the same as when labor sets in. It is important and very convenient to recognize a breech, a face, or an occiput posterior before labor begins, in order that one may be better prepared to meet these more difficult conditions. For the proper determination of position, both antero-posterior and lateral plates are often necessary.

No mistake could be more unfortunate—no embarrassment greater—than the failure to diagnose the presence of a monstrosity, particularly when there is disproportion due to a hydrocephalic baby, and to attempt a version, a difficult forceps, or an abdominal section in such a case; when the correct procedure should be a craniotomy. It is most important that the diagnosis of a monstrosity be made before labor begins, in order to properly meet such a contingency. No method available is a more certain aid in the diagnosis of such cases than the employment of the roentgen-ray.

It occasionally happens that a patient comes to us during the last trimester of pregnancy, for the first time. She had felt life until a few days ago, and is now anxious to know whether her baby is still alive. An examination reveals a very obese type of a patient with a polyhydramnios, making it very difficult to hear the fetal heart. The diagnosis here, as in many other similar cases, may be doubtful, but can be readily cleared up by the aid of an *x*-ray film. If the baby is living, the outline of the fetal skull is regular, but in the presence of a dead baby, because of absorption of some of the cerebral fluid, the bones overlap and the scalp folds, giving the head a very irregular outline.

As to the diagnosis of early pregnancy by the aid of the *x*-ray, one should be able to make a diagnosis by the ordinary methods just as early. It will, however, be of considerable value in helping to differentiate between pregnancy and a tumor, particularly in the presence of a dead baby.

CASE REPORTS

CASE 1.—History.—Mrs. N. P. W., aged 38, first seen during the third month of pregnancy. The blood pressure and urine were normal throughout. The external measurements were 26, 28, 32 and 20. Was delivered February 1, 1924, of a baby girl weighing seven and one-fourth pounds, after being in labor for four hours.

CASE 2.—History.—Mrs. E. A. M., a nurse, gravidara two and para one, aged 28, first came to me at three months. The blood pressure and urine were negative at all times. The pelvis measured 21, 26, 31 and 18.5. Her first labor was prolonged and after a difficult version was

delivered of a dead baby. On December 8, 1923, she came to the office in labor and was immediately sent to the hospital. Within four hours the cervix was almost

completely dilated and remained at this stage for two hours without further progress, in spite of strong uterine contractions. After doing a deep left medio-lateral episiotomy and rather difficult mid-forceps, delivered her of a baby boy weighing seven pounds.

CASE 3.—History.—Mrs. C. K. S., aged 27, para two, was first seen at five months' pregnancy. Urine was normal at all times. The blood pressure was normal up to the latter part of the eighth month, then there was a gradual rise. Patient had convulsions with her first baby and was delivered by difficult version and extraction. External measurements were 25, 28, 35, and 21. September 23, 1923, quinine and castor oil were given in an effort to induce labor. On the following day she began to have pains. The position and presentation was O.L.P. After two hours of strong uterine contractions in the second stage of labor without any progress, the head was rotated, manually, into the transverse diameter, the forceps applied in the oblique, and a nine and one-half pound boy delivered.

CASE 4.—History.—Mrs. E. L., aged 25, para four, first seen at the dispensary during the last month of pregnancy. On January 8, 1924, a diagnosis of breech presentation was made and this was immediately verified by the aid of the x-ray. The patient was at term and because of previous difficult labors was advised to enter the hospital.



Fig. 1. This is an x-ray film of the patient (Case 1) taken December 23, 1924. It shows a perfectly normal pelvis, an average sized baby, with sufficient room for the presenting part to pass without difficulty.



Fig. 2. This film was made November 30, 1923, and shows a common form of contracted pelvis. It is high and narrow, the hip bones do not have the normal flare, and the inlet is larger than the outlet, giving the form of a masculine or funnel-shaped pelvis. The head is riding high, and although of average size meets with considerable difficulty at the outlet.

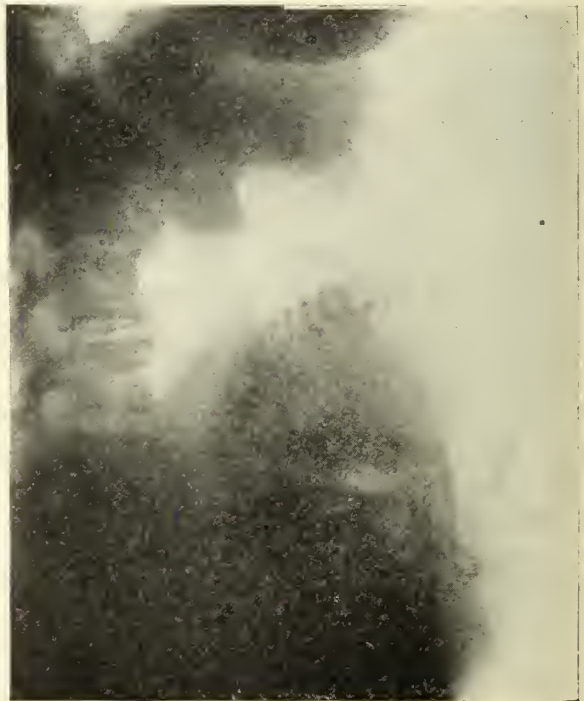


Fig. 3. X-ray pictures were taken September 7, 1923. The one illustrated here shows the spine of the baby pointing towards the spine of the mother, making this an occiput posterior position. An antero-posterior picture was also taken and this showed the spine of the baby to be on the left side of the mother. From both films it was obvious that the position was O.L.P.

Two days later she was admitted and the diagnosis of vertex presentation was now made. This also was checked up by an x-ray film.



Fig. 4. An antero-posterior view showed a normal pelvis, a good sized baby, breech presentation, with back towards the left side of the mother. The other film, which was made at the Ancker Hospital two days later, showed the head deeply engaged within the pelvis.



Fig. 5. This film was taken June 23rd, and clearly shows two babies each presenting by the vertex. One head is deeply engaged while the other is at about the level of the umbilicus. The babies are small and from their position should give no difficulty at the time of delivery.

Comment.—Case 4 is interesting in that it demonstrates the fact that a breech may correct itself at any time, even within a very short time before labor begins. Most breeches diagnosed early in pregnancy rotate before labor sets in if there is no special cause for their presenting as such. However, in cases due to some special cause, such as hydrocephalus, short cord, cord around the neck, etc., they usually remain and deliver as such.

CASE 5.—History.—Mrs. C. H., para three, aged 26, first came to the Ancker Hospital Dispensary in her eighth month of gestation. The blood pressure was 150 over 80 and her urine showed a trace of albumin. Abdominal examination revealed two palpable heads, multiple small parts and two distinct fetal hearts. The diagnosis of twin pregnancy was made and immediately confirmed by the aid of the roentgen-ray.

CASE 6.—History.—Mrs. A. P., para one, aged 19, was first seen at the Ancker Hospital Dispensary at seven months. Her measurements were normal. Blood pressure was normal and the urine negative until one week before delivery, when it showed a heavy trace of albumin, some leucocytes and occasional casts. The patient complained of frequent dizzy spells for a period of two months before labor set in. An examination showed the abdominal and uterine muscles to be very rigid, so that it was difficult to



Fig. 6. The illustration shows an abnormally large head, irregular in outline, and a comparatively small body. The irregularity of the head is due to absorption of some of the cerebral fluid, giving rise to some overriding of the bones.

make out the small parts. The heart tones could not be determined, although the patient claimed to be feeling life. From the size and consistency of the presenting part at the brim, and because of the persistent absence of fetal heart tones, the diagnosis of a dead hydrocephalic baby was made and this confirmed by the aid of a roentgenogram. May 14th the patient was delivered of a dead hydrocephalic.

CONCLUSIONS

1. The foregoing observations aim to emphasize the fact that the frequent employment of the roentgen-ray is a necessary procedure.

2. The cautious use of the x -ray at any time during gestation is not harmful in the least to the baby.

3. It helps to determine those findings which are looked for during the prenatal care of a patient. Pregnancy, with its normalities and many of its abnormalities, and its differential diagnosis, may be determined in this way with the greatest possible degree of accuracy.

4. In any case which hints a possible difficult delivery or abdominal section, the use of the x -ray is not only desirable but essential.

5. Its employment for the first time is certain to give more information than was originally looked for and will prompt the desire to employ it more in other cases, even though the indications be less urgent.

Prophylactic Inoculation of Dogs Against Rabies.—The evidence for the efficiency of prophylactic immunization in persons bitten by rabid animals has long been too convincing to permit of doubt. In Japan experiments to reduce the frequency of rabies by inoculation of the dog population show that its frequency with dogs has been greatly reduced (Jour. A. M. A., July 5, 1924, p. 44).

"Sero" Endocrine Preparations.—A circular "For Endocrine Therapy" bears the name of R. A. White, Los Angeles, and Cal. Endocrine Foundation Laboratories, Long Beach. It advertises "Asthma Sero," "Antitoxoid in Tuberculosis," "Rheumatism Sero," "Nephro Sero," "Pneumonia Sero," "Abscess Sero," "Tabes Sero" and "Malnutrition Sero." In connection with each product appear words which, if read hurriedly, might be taken by some as a statement of composition. For instance "Antitoxoid in Tuberculosis" is said to contain "Orco-plasm, Thyroid Extract and Phosphor Iodide." "Rheumatism Sero" is said to contain "Orco-plasm and Thymus Iodide." The circular contains the vague statement that orco-plasms are compounds that "represent unchanged protoplasm and serologic organic and inorganic substance." It contains also the unenlightening statement that "the Inorganic Substances in the Seros are in form Physiological Solutions." The circular wisely makes no attempt to define "phosphor-iodide" and "thymus iodide" (Jour. A. M. A., July 5, 1924, p. 58).

INTUSSUSCEPTION IN INFANCY*

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Intussusception, the condition where one portion of intestine slips into an adjoining segment causing a tumor and obstruction, is not common, but one of the most dangerous of acute abdominal conditions met in infancy. My object is to review the subject briefly, emphasizing especially the importance of early recognition of symptoms, early diagnosis and treatment, thus giving the infant the best chance of recovery.

The high mortality in intussusception reported during the last twenty years is due mostly to two factors—the tender age of the patients, and the late diagnosis and treatment. In one series of 374 cases, extending over twenty years—reported from St. Thomas Hospital, London—the average mortality was 32 per cent. Beginning in 1898 with 48 per cent this had decreased by 1918 to 19 per cent. In other cases reported, one group of 112 cases from the Children's Hospital of Boston, had a mortality of 39 per cent. One of twenty-three cases reported by MacAuley had 17.3 per cent. The lowest was a group of twenty cases reported by Goldschmidt in which only 5 per cent were fatal. Thus we see that the death rate has been very high but also that this has gradually decreased in recent years. It is my opinion that our present statistics would show a mortality rate considerably lower.

Over one-half of all cases of intussusception occur before the ninth month and about three-fourths before the second year. It is two or three times more common in males than females. The younger the infant the more rapid the course.

The types in the order of frequency in which they occur are as follows:

1. The ileo-cecal (about 80 per cent). In this the cecum with the ileum behind it passes into the colon, the ileo-cecal valve continuing to be the apex of the projecting portion.

2. The ileo-colic, in which the ileum passes through the ileo-cecal valve, the ileum being the prominent protruding part.

3. The colic, limited to the large intestine only.

4. Ileac or enteric, limited to the small bowel.

*Read before the Southern Minnesota Medical Association, Mankato, May, 1924.

The occurrence of this condition in infancy is due to the weaker development of muscle and elastic tissue and a correspondingly thin intestinal wall. At birth the colon and ileum are almost the same size and by the fourth or sixth month the colon is three or four times as large as the ileum. The rapid growth and increasing disproportion between the diameter of the large and small bowel is usually accompanied by a large relaxed ileo-cecal valve. The colon in these cases usually has a long swinging mesentery. In many instances the ileum enters the cecum not at a right angle as normally but almost in a straight line. Other causes are given such as abnormal peristalsis due to undigested food; any intestinal irritation or foreign bodies; trauma or local meteorism.

The onset is sudden in most instances. There is scarcely any other condition in infancy which strikes so quickly from a clear sky. It usually begins with sudden, violent, abdominal pain, accompanied or followed shortly by vomiting. These two symptoms are almost always present. At this time there are usually one or two stools containing fecal matter. Later, stools of mucus, mucus streaked with blood or even pure blood may appear. This is accompanied by pallor, anxious facial expression, general muscular relaxation and shock. The prostration is often out of proportion to the other symptoms. Usually there is marked restlessness early, but later, apathy and dullness. The temperature is not elevated the first twenty-four hours and may be even sub-normal. The abdomen is most often relaxed, later is usually distended, and a tumor can often be felt on palpation.

1. Pain is rarely absent and is a prominent symptom in over four-fifths of all cases. It comes suddenly, may be uninterrupted at first but later is usually intermittent in character, varying in intensity but inclined to come at rather regular intervals. This is accompanied by high pitched crying, either continuous or intermittent, the infant often assuming peculiar positions, frequently the prone. The face is usually pinched and pale and shows plainly that the child is suffering. With beginning collapse the pains may be indicated only by regularly repeated moans and the drawing up of the legs. In a few hours the pain and symptoms of shock may disappear for a time, which may be due to an edema of the bowel; this is a deceptive lull should the physician see the baby at this time.

2. Vomiting, present in four-fifths of the cases

reported, is reflex in character, is usually early but may be absent until the second day. In a few cases there was none. It may occur at intervals or be almost continuous, and is more constant if the invagination is in the small bowel. It is aggravated by food or laxatives. It must be remembered that although vomiting is a common symptom in infants, in this instance it is usually more urgent and comes in an otherwise healthy baby.

3. After the lower bowel is emptied of fecal matter, the stools in acute cases with complete obstruction have no fecal odor and there is absence of gas by rectum. Blood in the stools is one of the most important and frequent symptoms and may vary from a few streaks to a severe hemorrhage. It was present in over 76 per cent of cases. It may be absent until the second day. In the sub-acute type the blood may cease for twenty-four hours, only to reappear.

4. The abdomen is usually soft, giving little resistance to palpation the first twenty-four to forty-eight hours. It may be retracted. There may be tympanites—especially the second or third day; its absence, however, is of more diagnostic value. A tumor can be felt in about 86 per cent of cases. It is often sausage-shaped but it may be only an insensitive mass. It is felt more easily during an attack of pain, for the consistency varies at times due to the spasmodic contraction of the intestinal wall. It may suddenly become soft and seem to disappear. It is most frequently felt on the left side. It may be localized at one time and later seem to be movable so that it can be palpated in any part of the abdomen. In a small percentage of cases it can be felt by rectum. Protrusion of bowel through the anus is a late symptom and indicates an invagination low down, or the telescoping of long areas of intestine. Localized tenderness is of some importance in the absence of a palpable tumor.

For reasons mentioned above an early diagnosis is urgent. One must rely much on the mother's history of the onset. In the presence of the four principal symptoms—pain, vomiting, abdominal tumor and discharge of blood and mucus from the rectum—diagnosis is not so difficult. Unfortunately, many cases do not have the typical onset and symptoms, and to catch these cases early, one must be on the alert and exercise extreme judgment in any acute abdominal condition. Failure in diagnosis is most often due to a tendency of physicians

to interpret active vomiting, with green mucus and bloody stools, as significant of a gastro-intestinal intoxication. Other conditions that might be confused with it are: volvulus, hemorrhoids, hernia and appendicitis, the latter being much less frequent in infants. As an aid in diagnosis an opaque enema is very important as it shows the exact location of the invagination. This is best given with a very small catheter to prevent straining. The fluid should flow in slowly, and under the fluoroscope, using gentle pressure to push the opaque contents along the colon, a conical shadow appears at the point of obstruction. If there is no obstruction the opaque enema will go through the ileo-cecal valve. (This valve has been found incompetent in 99 per cent of normal infants.)

The treatment has only one object—that of reducing the invagination by medical or operative methods. Either, however, is a mechanical procedure. A few men plead for less haste in using radical methods especially when seen early. Some advise an attempt at reduction with water or air by rectum under slight pressure. The usual method is to use two quarts of normal saline with irrigating can four feet above the body, injected through a good sized catheter, with hips elevated ten to twelve inches above the shoulders. The buttocks are held to help retention, while gentle manipulation of the mass through the abdominal wall is made. This procedure is more safe and successful if used with light anesthesia. Some advocate small doses of opium to quiet the bowel. This method is useful when the obstruction is in the lower segment of the bowel but must be used early. One objection to its use lies in the inability to control the apparent results. Another is the danger of rupture of the thin bowel. Also, disappearance of the tumor may be due only to a change in its position. If unsuccessful in the first attempt we should at once turn to surgical interference. Modern opinion is tending more and more to the idea that immediate surgical intervention is the best treatment.

I will not go into detail as to surgical procedure but will mention a few things of interest in this regard. About 89 per cent of cases can be reduced by opening the abdomen. Reports show that favorable results depend more on the time elapsing before surgical intervention than on any other one factor. The percentage of recoveries when operated within the first twenty-four hours is about two and a half times greater than if operation comes after

the twenty-four hour interval. The operation should be as short as possible, cutting down the anesthetic to the minimum. The death rate increases directly with the amount of work done. Therefore, there should be as little manipulation as possible, and it has been definitely shown that removal of the appendix or any extra procedure increases the risk. It is important to reduce the invagination from the apex, pushing instead of pulling. If irreducible, reports show it is best to make an artificial opening into the bowel, waiting until later to resect the segment. Most cases under thirty-six hours can be reduced. The proportion of operative cures of intussusception is steadily increasing. This is due not only to improved technique, but in a large measure to more careful attention to early diagnosis.

I will cite but two recent cases to show that we can get results with the more conservative treatment, but especially to stress the importance of early operative interference when indicated.

CASE 1. Herald S., a boy six months old, breast fed. Had a cervical abscess at two months; otherwise healthy. Had been restless and not nursing well and had some symptoms of intestinal irritation for two days, when at 5 A.M. he began crying and seemed in severe pain. The mother gave an enema with no relief. The stool was slightly green. Vomiting began at 10 A.M. At 12 o'clock the baby was taken to a physician, who looked for a hernia as the cause of pain. He suspected appendicitis, but thought it was most likely an ordinary intestinal disturbance. Several enemas during the afternoon and night gave no relief. He continued to vomit and cry with pain, resting scarcely at all. At 8 P.M. there was a stool with considerable blood. The physician saw him again at 6 A.M. and at this time, on account of the continued pain, vomiting and bloody stool, he suspected an obstruction. The baby was sent to the hospital, where I saw him at 10 A.M., twenty-nine hours after the apparent onset. On examination he was pale, slightly drowsy and in evident distress. The temperature was 103.8 degrees. The abdomen was relaxed, a tumor cylindrical in shape, about three inches long and movable, was felt on the left side at a level with the navel. This was not felt by rectum. A saline enema was given as described above, and on gentle manipulation the bowel was definitely felt to separate and the tumor disappear. The baby was more comfortable and slept well. In a few hours the stools began to show fecal matter, although the blood continued in small amounts for thirty-six hours. The temperature dropped to 101 the same day and to normal the second day. He left the hospital in good condition the fourth day.

CASE 2. Eugene C., a normal breast-fed boy of five months. Had whooping cough at one month. He had a nasal and ear infection for three days, when, while sleeping, at 11 P.M., he suddenly began to cry bitterly. He writhed and squirmed in severe pain continuously for thirty

minutes. He then became quiet and was drowsy and pale during the night. He slept some but was restless at intervals. There was considerable retching but he was unable to vomit. One hour after onset there was a greenish liquid stool of fecal matter. At 7 A.M. a second stool containing only mucus streaked with blood. I saw the boy at 8 A.M., nine hours after the onset. He was restless, pale, with considerable prostration and muscular relaxation. The abdomen was flaccid, a prominent mass could be seen just below the navel in the midline. This was rather firm, sausage shaped and freely movable, and could not be felt by rectum. The temperature was normal and pulse only slightly accelerated. During examination there was some attempt to vomit and a large bloody stool with no fecal matter or flatus. At 10 A.M., eleven hours after the onset, he was given a saline enema under considerable pressure and on manipulation the mass was felt to disappear, and it was supposedly reduced. The baby was more comfortable and had less evidence of shock. He passed some flatus and fecal stools during the day with but streaks of blood. There was no vomiting. No tumor was felt on careful palpation on several occasions during the day and evening. The abdomen was slightly tender with beginning tympanites. At 7 A.M. the following morning, the boy became more restless, tried to vomit, and there was a large bloody stool. He again showed more prostration and a mass was now felt low on the left side. This was not reduced by enema. Laparotomy was done thirty-eight hours after the onset and an ileo-cecal invagination was found with the valve and appendix carried along in the colon to the descending portion. This was reduced without difficulty and the appendix removed. The mobility was due to a very long mesentery along the cecum and entire colon. The boy made an uneventful recovery, leaving the hospital the eleventh day. In this case, although the symptoms improved and the boy was definitely better, the question remains as to whether the invagination was even partly reduced at the first attempt.

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DISCUSSION

Dr. F. C. Rodda, Minneapolis: It is a pleasure to discuss the excellent paper of Dr. Grise since it is a subject in which I am much interested.

We are much indebted to Dr. A. W. Abbott for his careful observation and report of twelve cases made before the Western Surgical Association in 1915. He showed us a clear, clinical picture of intussusception in infancy which briefly is as follows: A normal infant, without premonitory symptoms, suddenly cries out with pain and presents collapse symptoms of pallor, depression and perspiration. This stage is soon recovered from, but it is followed by periodic attacks of pain during which the infant draws up its legs, or if old enough assumes the knee chest posture. Between the attacks of pain, the child may appear well and react normally. There is no fever. After some hours there *may* be vomiting and there *may* be passage of bloody mucus from the bowel. The symptoms are so clear-cut that in our series of cases the diagnosis has been made by the mother in three instances—once in a recurrence in the same child, once in a second case occurring in the same family, and once by a mother who had been a nurse.

Aside from the classification with reference to the portion of the gut involved there are three types: (1) acute, with profound persistent collapse; (2) acute, with moderate symptoms of collapse at onset; (3) chronic.

It is not sufficiently widely recognized that there is a type of this disorder which may last for days or even weeks. We have had three such cases lasting from six days to as long as three weeks. Bergstrom in the May, 1924, number of the *American Journal of Diseases of Children* reports four cases lasting from eight to sixteen days. These cases vary from the acute ones only in that there is not a complete obstruction of the bowels.

The basis of my discussion is a series of twenty-six cases which have been observed personally.

Age incidence.—Nineteen were in infants six months to one year old; three were in infants under six months; and four were in infants over one year.

Subjective symptoms.—

- (a) Pains. All had the characteristic pains.
- (b) Vomiting. Several did not vomit at all and often it was a late symptom.

Objective findings.—

- (a) Tumor. In not every case was the tumor palpated. It is most easily palpated during an attack of pain. In very late cases, it may be felt by the rectum. X-ray examination may give confirmatory evidence when the mass has been recognized through the abdominal wall.
- (b) Blood from the bowel is usually found in small amounts if looked for early. Subsequently, in the mild, acute cases and in the chronic cases it may not reappear for days. It is not pathognomonic.
- (c) Posture. Abdominal pain as evidenced by position of the legs and the posture is always found if the child is watched for a long enough period.

Failure to find the tumor at the time of operation does not nullify the diagnosis. Due to the relaxation produced by the anesthetic and traction on the bowel, the tumor may not be delivered in the abdominal opening. But careful search will show an edematous, dark-colored bowel where the mass had been.

Complications.—We had one recurrence in the same child one month after the primary operation. The mass was reduced a second time, and the child made a complete and permanent recovery. There were two cases of evisceration from the opening of the operative wound. These wounds should be closed with appropriate retention sutures.

Mortality rate.—We consider operation the only safe and sane treatment. Of the twenty-six cases operated upon, five died,—a mortality rate of 19.2 per cent. A number of factors enter into the mortality. Other things being equal, the earlier the diagnosis is made and operation resorted to the greater the chances of a speedy recovery. But in some of our cases, even at early operation, the mass could not be reduced and the bowel was gangrenous, while in cases lasting many days the mass was easily reduced and the bowel showed little damage. It is largely a question of mechanics. A strangulated bowel means a grave prognosis.

Nicomors.—The Council on Pharmacy and Chemistry took up the consideration of Nicomors, stated to be a medical preparation for the alleviation of the physiologic effects of nicotine at the request of the Nicomors Products Company. Nicomors comes in the form of tablets which are claimed to contain magnesium peroxid and tannic acid as their essential constituents. It is claimed that with the use of Nicomors the effects of tobacco smoking show very little or not at all. It is even claimed that the preparation has a favorable effect on the stomach and the intestines. The Council reports that the claim that the random use of a mixture of magnesium peroxid and tannic acid has a favorable effect on the stomach and intestines, is without warrant, and that the claim that the ill effects of tobacco smoking can be overcome by the use of Nicomors is not credible and not supported by any acceptable evidence (Jour. A. M. A., July 19, 1924, p. 212).

THE INTERPRETATION OF ABDOMINAL PAIN IN CHILDREN *

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It being manifestly impossible to do justice to so extensive a subject in a brief paper, only some of the commoner conditions, the causes of which are frequently overlooked, will be emphasized.

Abdominal pain, as a symptom of trouble not necessarily within the abdominal cavity, occurs perhaps more often in children than adults; at the same time, it less often points to surgical conditions within the abdomen than is the case with adults. To some extent, diagnosis is simplified as compared with that in adults. Cholecystitis, cholelithiasis, gastric and duodenal ulcer, carcinoma of the abdominal organs, affections of the female pelvic organs, and tabes dorsalis, so commonly causing abdominal pain in adults, are exceedingly rare in childhood. On the other hand, it must be borne in mind that acute surgical conditions in children require prompt diagnosis, as usually they will not tolerate temporizing to the extent possible with adults.

Because of the tendency for various affections to apparently cause reflex pains in the abdomen, and because of the difficulty in getting the average small child to coöperate in localizing the pain, particular care must be exercised in making the diagnosis. This is commonly not easy, for in addition to the task of evolving a satisfactory history from the nervous mother, there is the inability or unwillingness of the small child to permit a careful examination of the abdomen. Generally the little patient will not do more than vaguely point toward the mid-abdomen as the location of the pain; commonly he will, by crying, make the examination very unsatisfactory. Not the least essential part of the physician's armamentarium, therefore, is an appreciation of the psychology of the average child; he should proceed deliberately and casually to become acquainted with the child, and gain its confidence; *then* examine the rest of the body, leaving the abdomen to the last. Realizing the susceptibility of the average child to suggestion, he must always be on his guard against prompting admissions without basis.

*Presented before the Ramsey County Medical Society, May 26, 1924.

In infancy, *colic* is the most common abdominal pain. This is most frequent in the first three months of life; it usually occurs at the same time daily—has a predilection for the afternoon and evening. The pain is paroxysmal, appearing and leaving suddenly; it is usually relieved by pressure or removal of flatus. Fever is absent. It is due usually to distension of the intestines. Gastric colic may occur, due to over-distension of the stomach by food, gas or air, and appears during or just after feeding. A pathologically tight anal sphincter may cause severe paroxysmal pains with severe distension of the colon; it is promptly relieved by the rectal tube.

Colic covers a multitude of diverse conditions in infants. Most babies tend to draw the thighs upward when crying, which is immediately interpreted by the onlookers to mean that the baby has pain in the abdomen. The trouble may be due to hunger, distress from overfeeding or too frequent feeding, indigestion from improper milk mixtures, constipation or diarrhea, with attendant gas formation. an over-tight belly-band, too much clothing and covers, eczema or chafing, otitis media, neuropathy (the desire of the spoiled child to be rocked), painful dentition, rickets, or scurvy.

Pylorospasm and *pyloric stenosis*, frequently manifesting themselves during the first three months of life, may cause cramp-like pains accompanying the peristaltic waves of the stomach, and are usually relieved temporarily by vomiting of a projectile type. These waves can often be seen through a thin abdominal wall, long before a pyloric tumor can be palpated.

Intestinal intussusception, comparatively common in infancy and early childhood, does not always cause severe paroxysmal pains after the onset. A mild pain may appear subsequently at fairly regular intervals, shown by only slight squirming or wincing on change of position. The child may cry for a moment until relieved by emesis. Shock is very often absent. The child usually lies quietly, preoccupied, not playful or normally interested in his surroundings. A toxic look often develops, especially later. Tympany is usually absent. It is necessary to distinguish this condition from enteritis or colitis, as often stools are passed, or produced by enemas, which contain blood. In enteritis the blood and mucus are quite separate from the feces; in intussusception the first stool or two may be normal, but the later ones con-

tain considerable blood and thin jelly-like mucus, intimately mixed with the feces, and possess a characteristic fleshy odor. Occasionally blood may not appear if the ileo-cecal valve is held closed, and not much of the colon is involved.

It is most important to seek the typical sausage-shaped tumor; this may be hard to make out because of the muscle spasm in the abdominal wall, or if too high in the abdomen, or too low in the pelvis. A general anesthetic may be necessary for satisfactory examination. Rectal examination is very important, but may be negative if the mass is high in the abdomen. Rectal examination can be practiced on even small infants, and is valuable in many conditions. Thorough lubrication of the examining finger is essential, and the little finger should be used when possible, that tears of the rectal mucosa with resulting bleeding may not thus occur to confuse the examiner. The tumor in intussusception may at first be felt in the transverse colon; later in the descending colon or rectum; it may even protrude from the anus.

The following case illustrates problems arising in diagnosis:

CASE 1. H. W., male, age ten months, weight 23 pounds. Previous history largely negative. He was doing well until suddenly at noon he began to vomit forcibly every hour or hour and a half. He would wake suddenly with a cry, and double up as though in pain, relieved for a while by emesis. The vomitus included bile. He had frequent hiccups and seemed weak and exhausted. He was seen by Dr. T. L. Birnberg at 6 P.M., who ordered an enema; this produced a dry, hard stool, followed by a large soft stool mixed with bright red blood and serum. He seemed better thereafter, did not cry, was more playful and apparently had no more cramps. Vomiting stopped for one and a half hours, when he vomited twice. He took water freely and retained it.

Examination showed a well nourished child, slightly fussy, but whose attention could be distracted by toys. The head, throat, and chest, were entirely negative. The abdomen was relaxed, soft and not tender on the left side. The right rectus was rigid and tender, just above the umbilicus, and while a definite mass could not be felt due to the rigidity, surgical pathology was suspected, and operation was advised. As the child seemed so much better since giving the enema there seemed a strong likelihood that an intussusception had occurred and had been relieved, and the parents were at first strongly opposed to operation. The rigidity in the right rectus, even though no mass could be felt by rectum, suggested that waiting was not justifiable, and the abdomen was opened by Dr. W. C. Carroll. Under the anesthetic a mass could be made out under the right rectus more easily, and this was found to consist of about six inches of the ileum invaginated into the cecum. This was separated without difficulty. The appendix was dark red and angry looking but was not removed. A complete recovery ensued.

Subacute intussusception as described by Bergstrom² causes intermittent and less severe pain; the vomiting is not continuous; the shock is less severe; repeated bloody stools are usually present. Obstruction is not complete, so less gangrene develops, and the diagnosis is often delayed until the condition is present a week or more. An abdominal tumor can usually be made out, although the assistance of a general anesthetic may be required.

Recurrent partial intussusception occurs more often than is recognized. It is characterized by repeated attacks of severe cramp-like pains across the abdomen, emesis, constipation, blood-streaked stools at times, and occasionally accompanied by a palpable tumor in the upper abdomen which disappears spontaneously. These attacks may recur every few months and may terminate in a complete intussusception, or require fixation of the ileum to the cecum and ascending colon to prevent recurrence. The following case illustrates the condition:

CASE 2. J. G. C., male, age eleven months, weight 18 pounds. He is being nursed seven times daily; gets no other food. Appetite is fair. Sleeps poorly. Nervous and irritable. Usually constipated. About seven weeks ago began to have attacks of colic accompanied by moderate vomiting; three of these occurred about one week apart. A month ago he had measles and five days later he had severe pains in the abdomen, off and on, for three or four days; vomited repeatedly; was blue, cold, and unconscious for a few minutes at a time. The mother said a mass could be felt in the region of the stomach for a few hours. He was given enemas to relieve him, producing stools containing blood and mucus, but very little fecal matter at first. The condition then improved and he was well, aside from constipation, until twelve days ago when he had another attack, lasting three days. He had severe pain at intervals, with frequent vomiting, and slight fever. Bright red blood appeared in the stools twice on the first night. The mass appeared several times during the attack. He was blue, cold and unconscious during the pains for a few moments according to the mother.

Treatment to prevent recurrence consisted in slowly adding solid food to his diet. This relieved his constipation, enabled him to put on weight, and improved his disposition. The increase in diet should serve to thicken the mesentery with fat and so lessen the likelihood of recurrence. No attacks have occurred since.

Abdominal pains accompanying *acute grippal infections, tonsilitis, etc.*, are very common in childhood, as has been emphasized by Brenneman³. The pains are usually intermittent, may be quite severe, and often give the patient much more concern than the underlying infection. They are usually located near the umbilicus but occasionally are diffuse or on one side. The pain is much worse

than the tenderness, quite the reverse of the case in appendicitis. It is probably due to inflamed mesenteric and retroperitoneal glands, which have been found in such cases where laparotomy was mistakenly done or when coming to autopsy. Infection of the glands may be hematogenous or due to swallowing of bacteria. Occasionally these cases also present diarrhea and vomiting, representing the cases probably justly called intestinal influenza. Peritonitis has been known to occur due to supuration of such a gland. The pain seldom outlasts the other evidences of infection. When prolonged it may be responsible for the so-called umbilical colic of unknown cause.

Lobar pneumonia causes abdominal pains so frequently in children, and is so readily mistaken accordingly for appendicitis, that their differential diagnosis is worthy of careful consideration. Diaphragmatic pain referred to the right lower quadrant of the abdomen, associated with vomiting, frequently is the initial symptom of pneumonia, and as Riesman⁹ said recently, "There is but one good rule to follow, and that is in every case of acute abdominal trouble to make a thorough examination of the chest."

White¹⁰, Hagaman⁶, Adams and Berger¹ have likewise emphasized the frequency with which pneumonia may simulate appendicitis. The last mentioned observers reported observations on a series of 145 cases of lobar pneumonia, of whom only sixty-six, or 45 per cent, were sent in with a diagnosis of pneumonia, while twenty-five, or 17 per cent, were sent in with a diagnosis of appendicitis. The latter figure seems far higher than is our experience, but illustrates how often these conditions are mistaken. It is quite likely that not a few of the cases of so-called ether pneumonia are actually primary pneumonias, operated on mistakenly for supposed acute abdominal pathology. Adams and Berger present admirably the differential diagnosis which is herewith in part quoted:

PNEUMONIA	APPENDICITIS
<i>Chest Pain and Cough:</i>	
Usually, but not always, present or ascertainable.	Almost never present.
<i>Abdominal Pain:</i>	
Often present (34 per cent of series). Usually higher in abdomen. Usually worse on inspiration. Often more severe and distressing. Lasts several days.	Always present. Usually lower in abdomen. Not affected by inspiration. Often intermittent.

PNEUMONIA

APPENDICITIS

Emesis:

Quite frequent (60 per cent), especially at onset.

Occurred in 68 per cent of cases.

Appearance:

Look very sick; flushed; fussy and irritable; toss about in bed.

Do not look so sick (except in severe cases). Lie quietly; no complaint (except when abdomen is palpated).

Respiration:

Short, rapid, shallow, with an expiratory grunt. Abdominal breathing; alae nasi dilated.

Quiet, not very rapid. Breathing tends to become costal in type later.

Temperature:

Usually 103° or above.

Often not over 99°, rarely 101°.

Pulse:

100 to 140.

Seldom over 100 to 110.

Onset:

Usually preceded by a cold.

No preliminary illness.

Respiration-Pulse Ratio:

Usually increased from 1:4 to 1:3, or 1:2.

Usually normal, 1:4.

Leucocyte Count:

Usually over 20,000.

Seldom over 20,000, unless abscess is present.

Lung Signs:

Definite signs are absent in 40 per cent during early stage.

Absent.

Tenderness in the Abdomen:

Tenderness seems more severe and more superficial, is not well localized, but is diffuse over a fairly large part of the abdomen, although varying in degree. Is usually higher in abdomen.

Pressure on left side causes no change in the pain.

Rectal examination is negative.

Tenderness may be slight, is not as general or as severe; is more readily localized usually to a small area in the right lower quadrant. It is deeper in abdomen and required often deeper pressure to be elicited. Is usually near McBurney's point, though in children may be higher. Pressure on left side of abdomen often causes referred pain in the right side. Rectal palpation often reveals local tenderness on right side.

Rigidity:

Often more severe than uncomplicated appendicitis.

Often very little rigidity, especially in early stage; increases if abscess or peritonitis threatens.

It is thus seen that pain, tenderness, rigidity and vomiting often accompany pneumonia, particularly when the process is in the right base; that the patient usually looks much more acutely ill than the

average case of appendicitis, and the change in respiration is all-important as a differentiating symptom. Finally, however, the safest procedure is to always require an x-ray picture of the chest if possible, before operating for appendicitis in children.

CASE 3. H. J., male, age two and three-fourths years. Two weeks ago while out of the city he was taken sick suddenly with severe pains in the abdomen; temperature was 106° to 107° for two days. No vomiting occurred. The pains lasted for two days, but he complained of soreness for a few days afterwards. The mother states that he would cry out and hold his sides whenever he would cough or breathe deeply. The case was diagnosed as stomach trouble. Since then he has been weak, pale, tired, wants to be held, refuses food, breathes rapidly, and is short of breath frequently. He contracted a slight cough just before his illness, but it was at no time very severe.

He was then seen by another physician, who, according to the mother, did not take his temperature or examine the chest, but diagnosed stomach trouble. When seen by us two weeks after he first took sick his temperature was 100.7° rectal; the chest showed complete flatness of the entire left side, with some displacement of the heart and distant bronchial breathing over the left lung. X-ray showed effusion almost filling the left chest. The Pirquet test was positive. Aspiration revealed considerable thin, clear, yellow fluid. The diagnosis was evidently lobar pneumonia with tuberculous pleurisy. The child has since improved considerably under rest and building-up treatment, with ultra-violet ray exposures.

In early appendicitis the pain is often referred to the epigastrium or umbilicus. Occasionally in young children the appendix is found higher and to the left, where it lies during fetal life, and may thus give atypically located pain and tenderness. Pain is much more severe in obstructive appendicitis due to a concretion. Emesis is much more frequent in children than adults, and, according to Fraser⁵, if vomiting is severe, it suggests distention of the appendix by its contents, and probably early perforation. Pelvic appendicitis may cause pain on urination, if the appendix lies against the bladder, or diarrhea if near the rectum. If near the obturator internus muscle it causes rigidity, and consequently pain on flexing the thigh inwards. The retrocecal appendix often causes pain and tenderness largely in the back, and may not cause emesis. Early diagnosis is essential in appendicitis in childhood, as rupture of the appendix frequently develops in twenty-four hours or less; furthermore the omentum is short, thin and veil-like in early childhood, and does not provide the protective power exhibited by it later. In consequence general peritonitis is a more common and earlier

development than in adults, and the relatively lower resistance to general acute toxemia gives it a much more ominous portent.

Inflammation of *Meckel's diverticulum* should be properly mentioned, as the pain, as well as the other symptoms, is seldom distinguishable from that of appendicitis. While a rare condition, the majority of the cases occur in children.

Green-apple colic, as well as that arising from other dietary indiscretions, occurs mainly in older children, and may cause very severe colicky pains, accompanied by vomiting, diarrhea, fever and occasionally convulsions. The pains are usually in the stomach region, and tenderness is usually absent. The history of the offending food, together with the relief usually produced by removal of it, generally clears up the diagnosis.

Tuberculous peritonitis is more common in children than adults, probably because of bovine tuberculosis transmitted by milk; also because sputum is swallowed more than by adults. It causes chronic abdominal pains, varying in every respect, especially depending upon the stage of the disease—whether distention, effusion or adhesions are present. The indefinite doughy masses often palpable, with the insidious onset, slight fever, and positive Pirquet test, assist in the diagnosis.

Acidosis frequently is accompanied by severe pains across the middle of the abdomen centering around the umbilicus. Nausea and severe repeated vomiting occur, with temporary relief of the pain by emesis. Children frequently confuse nausea with pain, thus misleading the examiner. Later severe pain may be due to straining of the abdominal muscles by repeated vomiting, and superficial tenderness may be present. The child is drowsy and often looks very ill; the abdomen is retracted, fever is usually present; acetone is present on the breath and in the urine. The alveolar air shows a low carbon dioxide tension.

Recurrent acidosis, or cyclic vomiting, may present the foregoing picture frequently, as any acute infection or digestive upset may precipitate an attack. Prompt measures to restore the disturbed metabolism and neutralize the ketone bodies are necessary, as very severe prostration or death may ensue.

Pyelitis and pyelocystitis occur frequently in childhood and are a frequent cause of abdominal pains not apparently associated with the kidneys.

Occasionally the pains are very sharp; they may be sufficiently severe to draw the attention away from other symptoms. More often they are vague and indefinite, usually near the umbilicus, but also often over the kidney regions. The pain is usually relieved by urination. High fever, vomiting, marked malaise, frequent burning urination and a peculiar pallor generally accompanying pyelitis. The condition is frequently overlooked because of the failure to obtain specimens of urine from small children, particularly girls, in whom 75 per cent of the cases occur. Pus may not be present at the onset in a few cases, but the urine will be swarming with colon bacilli, as has been shown by Ramsey⁸. The following case illustrates the difficulty occasionally present in attributing the pain to pyelitis.

CASE 4. D. K., female, age six years. She has had frequent attacks of severe pain in the abdomen for about three years. Previously they occurred about every three months, lately every two or three weeks. The pains last about two hours, do not radiate or cause her to double up. She usually vomits several times during the attack, is sometimes feverish, and the abdomen is very tender for a few hours afterward. Urination is usually frequent. About one and a half years ago the condition was diagnosed as appendicitis and operated, but no particular relief was obtained. When first seen by us she was in a typical attack, and the urine was full of pus. Under appropriate treatment she has improved materially and has had no attacks for over two months, while the urine is almost normal. There have never been red blood cells seen in the urine. X-ray picture and Pirquet test were both negative.

Calculi in the kidney, ureter and bladder occur occasionally in children, and cause severe paroxysmal attacks of pain, with fever and pyuria; usually a little blood may be found in the urine. The pain tends to locate more in the abdomen than in adults. The following case is illustrative.

CASE 5. J. C. F., boy, age six years. He recently contracted mild scarlet fever and, while convalescing, red and white blood cells were very frequent in the urine; but very few casts and only a little albumin were present. During the following month he developed two attacks of severe pain in the mid-abdomen radiating down the bladder region, or passing from the genitals around the anus and up the sacrum, occurring just after urinating. On one occasion he had pain in the right side of the abdomen for a half hour, not related to urination. The urine showed considerable pus and blood, but no casts and only a faint trace of albumin. An x-ray picture showed a stone at the junction of the right ureter and bladder, and when repeated a month later, was unchanged in position or shape. Operation has been advised.

Acute ureteritis may present symptoms exactly like those of an actual stone in the ureter; it may also simulate appendicitis. It may follow the pass-

ing of a stone, or may be due to bacillus coli infection.

Pain due to a distended bladder, as pointed out by Brenneman⁴, is not uncommon, and is often due to phymosis, balanitis, or ulceration of the external urinary meatus. The pain may be quite intense, and the infant in severe discomfort until relieved, either voluntarily or by catheter. The abdomen reveals in these cases the typical pear-shaped tumor in the bladder region.

Gastric ulcer, while very uncommon in children, does occur, and presents the usual history of pain during or soon after meals, located in the epigastrium, and relieved by vomiting.

Gastric hyperacidity occurs occasionally in children, and causes a dull, annoying pain above the umbilicus, usually before meals, and especially before breakfast. It is occasionally severe and colicky. The child may be awakened by it. This condition, as pointed out by Kerley and Lorenze⁷ is usually secondary to diet errors, or enteroptosis. Nausea, especially before meals, relieved by taking food may be the only symptom. The appetite is usually poor, eructations of gas, belching, and constipation commonly occur. X-ray examination usually shows a hypo-motility of the stomach and often gastroptosis. The gastric contents show high free and total acidity.

Acute stitch is a common complaint in older children, occurring when running or walking and causing pain below the ribs on either side. It is apparently only a strain of the abdominal muscles, and is not associated with tenderness, swelling or fever.

Retention of the testis may cause severe pain if the testis swells as it may do at puberty. It may cause pain and local tenderness in the iliac fossa. Fever is absent. Examination of the scrotum will suggest the source of the pain.

Henoch's purpura, though rare, deserves mention because it causes severe abdominal pains, with blood in the stool, and thus may be confused with intussusception. A purpuric rash elsewhere on the body makes differentiation possible.

Acute pericarditis may cause severe pain and

tenderness in the abdomen, and, combined with fever and prostration, may often resemble peritonitis. Incompensated heart cases often complain of pains in the abdomen, possibly due to enlargement of the liver, and gas pressure in the stomach.

Umbilical hernia, in older children, apparently causes a chronic vague pain in the mid-abdomen, which may require operation for relief, even though the hernia may be small.

Neuropathic pains, neurosis or hysteria occasionally are the only apparent explanation for some cases of abdominal pain where no definite localization or evidence of organic pathology is present. Such a diagnosis should be made reluctantly in any event, as the probability is that most of these do have some kind of trouble of minor nature, but, occurring in nervous, high strung, temperamental children, born of neuropathic or neurasthenic parents, they have a low threshold of consciousness, and so feel trivial pains much more keenly than other children. Occasionally the pains are fictitious, due to a desire of the child to avoid eating foods he dislikes, or to avoid disagreeable tasks—and the pain is quickly lost when the suspected cause is eliminated.

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ATTEMPTED PREVENTION OF MEASLES IN PRIVATE PRACTICE*

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It is gradually becoming more generally accepted that measles, with its severe bronchial and upper respiratory inflammation, is no longer to be looked upon as a trifling affair. Because of a heavy death rate among youngsters, and because of the many unfortunate sequelæ, it commands our respectful consideration.

There are several groups of cases which particularly warrant attempted avoidance of this disease. We may mention: babes at breast of mothers known never to have had measles; feeble or debilitated infants or children; children sick with respiratory infections; and, in general, all cases of infants and very young children. There are also those cases where it is particularly desired to do everything which may possibly assist in preventing measles, even when the individual is older or one in good health.

Institutions in which measles as a cross infection is an unwelcome guest have, for a number of years, been successfully using convalescent measles serum as a prophylactic in cases of exposed non-immunes. The experience here and elsewhere has demonstrated quite conclusively that, in proper dose, serum, given within the first four days after exposure, prevents measles. Most authors agree that prevention is unlikely if more than five days have elapsed between first exposure and institution of treatment.

Serum from recent convalescents contains antibodies in such concentration that relatively small doses will afford protection. That taken from persons having had the infection years previous, while containing sufficient protective substance to insure the donor against secondary attacks of the disease, protects others only when larger sized doses of blood or serum are used.

Recent work of the Board of Health of New York City is a notable example of the extension to private practice of the benefits of this preventive. Prepared in a large laboratory, from convalescent measles cases, plasma is now available for the use of physicians in attempting prevention of the dis-

ease among very young children with known exposures. A personal communication from Dr. Wm. Park, director of the bureau of laboratories, states that since January of this year the department has given plasma to about 1,500 little children—as he says “with excellent results, either complete prevention or very, very mild attacks.”

Few, if any of us, can go into the open market and secure serum or plasma. Serum prepared by institutions is rarely available for use outside their walls.

This paper is being presented for the purpose of showing what can be done in private practice with the means at hand. I refer to the injection of whole blood from measles convalescents in the family.

The use of whole blood as described in this paper has been reported by but few authors. Recently Zingher reports the use of the method in thirty-one cases treated in institutions where the exposure had taken place. His cases were injected on the second to eighth days after exposure with an average of 19 c.c. of whole blood. Of this group, three developed measles. They were cases that were injected on the seventh and eighth days. Except for two adults, all were children under seven years of age.

Less favorable results are shown in the cases herewith presented. The results are offered as indicating what may be expected of cases handled under the conditions with which the majority of physicians find themselves working. The situation one meets in attempting this sort of thing in a home is materially different from its application in the infectious disease hospital.

The material presented itself during an epidemic of measles and whooping cough occurring in a city of 20,000. The two infections went hand in hand. Over 500 known cases of measles occurring between January and May, 1924, represents, as usual, but a part of the estimated number.

The data presented are meager for the reason that they were secured by the writer during a very busy period. All cases were handled in the homes and the follow-up work was done whenever opportunity presented. A surprising number of people of the less-enlightened class feel that measles requires no physician, save occasionally for a single visit to diagnose the initial case in the family.

The project was to secure blood from some member of the family for injection into the non-immunes who had had known exposure to measles. It was hoped to procure prevention or modification of the

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measles in the secondary cases. Donors included parents or blood relatives who had had measles at some remote period, and brothers or sisters recently suffering from the infection. In most cases these latter were the source of exposure of the recipients.

The technic is extremely simple. Blood is drawn with aseptic precautions from the arm veins, a 30 c.c. syringe with rigidly attached needle being used. As soon as the blood is secured a second needle is substituted. The injection is made at once, either intra-muscularly or subcutaneously. There has been no difficulty experienced in completing the entire procedure before the blood clots. No citrate was used, for it proved unnecessary. At most but three to four minutes need be consumed in completing the process for one or two recipients.

In only one case was any difficulty encountered in securing the amount of blood previously decided upon. The donor in this instance was four years old.

No reaction followed the injections, and very little discomfort was reported.

The following brief protocols of the cases are summarized in the accompanying table.

Case 1.—R. P., female, aged 2, was under treatment for whooping cough of about five weeks' duration, when she was exposed to measles by her brother, aged 6.

Jan. 17. Brother seen with typical measles in early eruptive stage.

Jan. 21. Brother donor of 20 c.c. whole blood, injected into R. P. intramuscularly without incident.

Jan. 28. Exposure to secondary case in sister seen on this date with full rash of typical measles.

No measles developed in the treated child after either of the exposures. Whooping cough gradually improved. Donor had temperature of 99 and was still coughing on the day blood was taken. He had an uncomplicated recovery.

Case 2.—B. L., male, 14 months old, weight less than 15 pounds. Gave history of several attacks of pneumonia and general weakness. Examination revealed a cleft palate, rickets and definite undernourishment. He could not hold up his head nor sit unsupported.

Jan. 7. Sister, E. L., seen with typical measles in the early eruptive stage.

Jan. 10. Sister had acute otitis media with temperature of 99. Ear opened under chloroform anesthesia and at the same time 10 c.c. blood taken. This was injected intramuscularly into the B. L. without incident. Patient was sent to home in a neighboring town.

Jan. 17. Reported that there was a very sparse rash beginning this date and lasting two days and accompanied by a very slight catarrhal phase with slight cough. Baby was hardly sick at all.

Feb. 12. A few weeks later it was reported that he was gaining weight and was considerably stronger.

Case 3.—D. S., male, age 16 months. About ten days previously had had a severe upper respiratory infection in common with all the other members of the family. Has mild rickets.

Feb. 11. Brother, M. S., had "fever and cold." No Koplik's spots or rash.

Feb. 12. M. S. Koplik's spots seen and sparse eruption on the face.

Feb. 14. M. S. Eruption at its height. Moderately severe measles.

TABLE
RECIPIENTS—MEASLES CONVALESCENT BLOOD

CASE No.	SEX	RECIPIENT		RELATION	DONORS		AMT.	ROUTE USED	INTERVAL	RESULTS
		AGE Mo.	DIAG.		AGE YRS.	HAD MEASLES PREVIOUSLY	BLOOD C.C.		FROM FIRST EXPOSURE	
1.	F	24	Whooping cough	Bro.	6	7 days	20	Intramuscular	7 days	No measles
2.	M	14	Malnutrition	Sis.	10	7 days	10	Intramuscular	7 days	Very, very mild measles
3.	M	16	Grippe	Bro.	6	6 days	10	Intramuscular	6 days	Very, very mild measles
4.	M	36	Grippe	Bro.	6	7 days	10	Intramuscular	7 days	Very mild measles
5.	M	60	Whooping cough	Sis.	6	7 days	10	Intramuscular	7 days	Typical measles
6.	F	24	Whooping cough-pneumonia	Sis.	7	7 days	8	Intramuscular	7 days	Very mild measles
7.	F	60	Malnutrition	Bro.	13	8 yrs.	30	Subcutaneous	4 days	Very, very mild measles
8.	F	12	Well	Sis.	5	8 days	2.5	Intramuscular	8 days	Mild measles
9.	F	30	Well	Moth.	32	22 yrs.	15	Intramuscular	5 days	Very mild measles
10.	F	72	Well	Moth.	32	22 yrs.	15	Intramuscular	5 days	No measles
11.	M	20	Upper-resp. infect.	Moth.	27	20 yrs.	30	Subcutaneous	5 days	Mild measles
12.	F	60	Well	Moth.	24	Childhood	30	Subcutaneous	5 days	Mild measles
13.	M	18	Whooping cough	Uncle	14	6 yrs.	15	Intramuscular	8 days	No measles
14.	M	48	Whooping cough	Uncle	14	6 yrs.	15	Intramuscular	8 days	No measles
15.	M	18	Upper-resp. infect.	Bro.	7	6 days	10	Subcutaneous	6 days	No measles
16.	M	24	Recent whooping cough	Moth.	33	Childhood	30	Intramuscular	4 days	Very mild measles
17.	F	24	Recent scarlet fever	Bro.	16	6 days	12.5	Subcutaneous	6 days	Very, very mild measles
18.	M	96	Well	Bro.	16	6 days	12.5	Subcutaneous	6 days	Very mild measles

Feb. 16. M. S. Temperature 99. Cough still fairly bad. In good general condition. Donor of 20 c.c. blood; 10 c.c. given intramuscularly to D. S.

Feb. 25. D. S. had scant rash on face and body. Koplik's spots present. He was cross, had very slight elevation of temperature, eyes did not bother him. Very slight cough. After one day more of the rash, it faded and he had no other symptoms or signs.

Case 4.—B. S., a male, aged 3. Exposure same as Case 3. Cases 3 and 4 are brothers.

Feb. 16. Ten c.c. blood from same donor as previous case, injected intramuscularly into B. S.

Feb. 23. B. S. had conjunctivitis, Koplik's spots, moderate eruption on face and body. Temperature 102, slight cough not sufficient to annoy patient. He was active and played about. Appetite unimpaired.

Feb. 25. Eruption fading. Not apparently sick at all. Mother's comment about cases 3 and 4: "Neither was what you could call sick."

Case 5.—B. H., male, aged 5. Was in school up to February 4.

Feb. 6. With sister, kept out of school because sister's condition was diagnosed whooping cough. Vaccine treatment was started for both children. B. H. had been coughing for two weeks but on this date neither child showed any signs of measles.

Feb. 13. Sister, aged 6, had a coryza and showed Koplik's spots. She had a very annoying cough.

Feb. 14. Sister had typical measles eruption and her case progressed as an average moderately severe case of measles.

Feb. 17. Sister, donor of 10 c.c. blood given intramuscularly to B. H., who on this date showed no signs or symptoms of measles.

Feb. 20. B. H. had typical measles with Koplik's spots and early rash. His case was moderate but did not seem to have been in any way aborted. From the time relations it seems highly probable that he was exposed to some other case than his sister. Probably exposure occurred in school.

Early in March both children were out of doors convalescing from whooping cough.

Case 6.—M. B., female, aged 2.

Feb. 12. Patient has had whooping cough for six weeks. When seen on this date had a definite broncho-pneumonia and was moderately sick. Half sister, E. J., had slight generalized eruption but no Koplik's spots.

Feb. 13. Koplik's spots present in mouth of sister, E. J. Prodromal rash gone.

Feb. 14. E. J. No rash present but there is an increasing cough and coryza.

Feb. 15. E. J. Cough very severe. Rash appeared and rapidly spread over the entire body.

Feb. 17. E. J., donor, 10 c.c. blood. Donor had no fever but presented an otitis media of mild type. Eight c.c. blood given intramuscularly to M. B., who continued to have scattered patches of broncho-pneumonia for several weeks with associated whooping cough paroxysms.

Mar. 3. M. B. presents scant rash on face.

Mar. 4. M. B. shows rash all over body. No Koplik's spots made out. No increase in catarrhal phase or temperature rise above that accompanying the pneumonia.

M. B. gradually recovered from her pneumonia and cannot be said to have been made appreciably worse by her mild measles.

Case 7.—R. K., female, aged 5. In school till March 13. No definitely known exposures to measles.

Mar. 13. Exposed to brother, J. K., who had "cold" and Koplik's spots but no rash. He ran the course of moderately severe measles.

Mar. 14. M. K., aged 13, older brother, in good health, who had measles at the age of five, was donor of 30 c.c. blood given subcutaneously to R. K.

Mar. 26. R. K. presented ten to twelve isolated macular lesions on trunk.

Mar. 27. The eruption consisted of 30 to 40 lesions on face and body. No Koplik's spots, no fever, no cough or coryza.

Mar. 28. Rash has entirely disappeared.

Case 8.—B. G., female, aged one year. Perfectly well.

Feb. 2. B. G. exposed to measles by sister, M. G., who presented early eruption and Koplik's spots on this date.

Feb. 8. M. G., donor of 2.5 c.c. blood, injected intramuscularly into B. G. More blood could not be secured.

Feb. 14. B. G. had typical measles eruption and questionable Koplik's spots but was not very sick. She did not cough as hard as her sister. She remained quietly in bed for one day, but was up and about the rest of the time. Mother said, "She was not as sick as sister."

Apr. 15. Both children now entirely well.

Both children passed directly from measles into typical attacks of whooping cough.

Case 9.—M. R., female, two and a half years old. Well. Never known to have had measles.

Mar. 8. Exposed to sister, H. R., who had fever, coryza, Koplik's spots, cough and moderate eruption on face and trunk when seen this date.

Mar. 9. Mother, N. R., aged 32, donor 15 c.c. blood injected intramuscularly into M. R. The mother, who was perfectly well, had had measles when 10 years of age.

Mar. 18. M. R. wanted to be held.

Mar. 19. Played all day. No symptoms.

Mar. 20. Vomited in the evening.

Mar. 21. Presented scant rash on face, a few Koplik's spots and moderate rash on trunk when seen. She had no fever, no cough, no coryza at any time. Slept well. Appetite unimpaired.

Mar. 22. Rash gone. Child normal in every way.

Case 10.—Harriet R., female, aged six and a half years. In school up to March 8. Cases 9 and 10 are sisters.

Mar. 8. Exposure same as Case 9.

Mar. 9. Mother donor of 15 c.c. blood given intramuscularly to Harriet R.

Apr. 15. Up to this time Harriet R. presented nothing abnormal. No suggestion of measles at any time.

Case 11.—Robert B., male, aged 20 months. Had slight cold. Exposed to sister, Ruth B., aged 3.

Mar. 16. Ruth B. had coryza and conjunctivitis.

Mar. 19. Ruth B. had Koplik's spots and early maculopapular rash on face and trunk.

Mar. 20. Mother, donor, aged 27, had measles at age of seven. Thirty c.c. blood injected subcutaneously. Mother was perfectly well.

Mar. 29. Robert B. slightly "fussy." Nose running. Cough.

Mar. 30. Robert B. coughing harder. No Koplik's spots.

Mar. 31. Robert B. has typical measles rash.

Case ran course of average mild measles.

Case 12.—J. L., female, aged 5. Perfectly well.

Mar. 15. Brother seen with typical measles. Koplik's spots, rash on face and body in early stage.

Mar. 16. Mother, aged 24, perfectly well, donor of 30 c.c. blood injected subcutaneously into J. L. Mother known to have had measles in childhood.

Mar. 24. J. L., cough and sneezing this date for the first time. Was slightly "peppless" the day before. Eruption on face. No Koplik's spots made out. Slightly feverish.

Mar. 27. J. L. ran course of moderate measles without particular discomfort. Mother commented, "She did not have nearly as much cough as brother."

Case 13.—B. F., male, aged 1.5 years. Suffering from whooping cough of about five weeks' duration.

Feb. 24. B. F. exposed to baby in neighboring family who developed measles. Exposure was in catarrhal phase of what proved to be typical measles.

Mar. 3. Uncle, aged 14, in good health, donor of 30 c.c. blood. He had had measles at age of 7. Fifteen c.c. blood injected into B. F. intramuscularly.

Apr. 1. Nothing suggesting measles has developed up to this time.

Case 14.—E. F., male, aged 4 years. Has whooping cough.

Feb. 24. Exposure same as Case 13.

Mar. 3. E. F. injected with 15 c.c. blood from same donor as Case 13.

Apr. 1. Nothing suggesting measles has developed up to this date.

Case 15.—S. G., male, aged 18 months, had suffered from repeated upper respiratory infections.

Apr. 7-12. S. G. exposed to brother, W. G., throughout course of typical measles.

Apr. 12. W. G., aged 7, donor of 10 c.c. blood injected subcutaneously into S. G. Donor's temperature was normal and there were no complications of his measles.

May 1. No evidence suggesting the possibility of measles has occurred.

Case 16.—D. M., male, aged 2. Recovering from whooping cough.

Apr. 5. Brother, F. M., seen with typical measles in early eruption stage.

Apr. 5. Mother, aged 33, in good health, donor of 30 c.c. blood given D. M. intramuscularly. The mother had had measles in childhood.

Apr. 14. D. M. a little fretful during night.

Apr. 15. D. M. has scant rash but no coryza. He has an occasional coughing spell of the type noted during earlier weeks of whooping cough. Mother's comment: "It was a very mild case. You wouldn't have known it to be measles if it had not been for the rash."

Case 17.—M. K., aged 2 years, female. This patient was released from scarlet fever but a week before this exposure to measles. She had otitis media as a complication of her scarlet fever.

Apr. 14-18. A. K., aged 16. Brother had the catarrhal and early eruptive stages of measles, exposing M. K. and L. K. (Case 18).

Apr. 20. A. K., temperature 99. Still coughing quite hard. Donor of 25 c.c. blood. Twelve and a half c.c. injected subcutaneously into M. K.

Apr. 28. M. K. presents twenty to thirty scattered lesions on face and back. These are macules of type seen in early measles. No Koplik's spots. No enanthem. Temperature 100.8-R. For several days has had a very slight coryza. No cough at any time.

Apr. 29. Rash increased slightly for twenty-four hours from onset, then disappeared.

Mother said, "She does not act as though she was sick at all."

Case 18.—L. K., male, aged 8. Perfectly well. Cases 17 and 18 are brother and sister.

Apr. 14-18. Same exposure as Case 17.

Apr. 20. L. K. received 12.5 c.c. blood subcutaneously from A. K.

Apr. 26. L. K. slightly nauseated.

Apr. 28. L. K. temperature 102.5. Throat red. Distinct enanthem. Typical salmon colored maculo-papular eruption on face and body, confluent on face. No cough, conjunctivitis or coryza. He said: "I don't feel sick a bit." Up and about, playing.

Cases 17 and 18 reported to be quite normal by the 30th of the month.

COMMENT

The number of cases here presented is small, and there exists marked dissimilarity among them in some essentials for comparison. The conclusions are drawn with a full appreciation of the fact that further study may alter them.

In considering the results let us bear in mind that it is rare for young children, who have not had measles, when exposed under conditions existing in the average home, to be spared from infection.

On the average, measles presents a fairly characteristic picture—with the respiratory disturbance of far greater importance than the eruption, or most phases of the systemic involvement. It is with the respiratory tract infection that most of the unfortunate complications are associated.

A majority of workers feel that the lasting immunity from the mild attack of the disease is preferable to prevention, which will probably be followed by a subsequent attack of the disease on later exposure.

Measles with very mild or absent catarrhal phase must be looked upon as a fortunate circumstance, but avoidance of the infection till some later period in the individual's life, a situation in some cases to be desired.

CONCLUSIONS

1. Whole blood from persons convalescent from measles is available to the physician in private practice in many instances where it is desired to prevent or modify measles after exposure of non-immunes.

2. Non-immunes may be temporarily protected against measles by use of proper amount of blood injected early in the incubation period following exposure.

3. Twenty to 30 c.c. of blood from an individual recently convalescent from measles, injected into the non-immune prior to the eighth day after first exposure, is a good working basis for further study of this problem.

4. When prevention is not secured, modifications resulting are distinctly to the patient's advantage. Mild measles has the advantage of conferring permanent immunity in all probability.

5. When blood from recent cases cannot be secured, that from individuals having had the infection at a more remote time should be used in somewhat larger doses.

6. With reasonable care in selecting donors and in carrying out the technic, the procedure is without danger to donors or recipients.

7. The method described is so simple that it can be utilized by any physician caring for measles cases in his private practice.

BACILLUS ACIDOPHILUS THERAPY

Through the use of bacillus acidophilus cultures a transformation of the intestinal flora of man from a proteolytic to an aciduric type can generally be induced. In cases of constipation beneficial effects in the direction of more ready defecations are said to arise. *Bacillus acidophilus* milk has attained the dignity of tentative recognition by the Council on Pharmacy and Chemistry, though this must not be interpreted as a recommendation for the use of the product. Bearing on the question of how bacillus acidophilus milk acts, experiments have been made which indicate that the action is a strictly bacteriological one, and not physical or chemical. It was found that bacillus acidophilus milk from which the bacteria have been removed was practically without effect in its influence on constipation. Regular bacillus acidophilus milk ingested subsequently resulted in an increase in the number of defecations.—*Jour. A. M. A., May 24, 1924, p. 1696.*

THE VALUE OF PROCTOLOGY IN GENERAL PRACTICE*

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It is desirable that practitioners of medicine and surgery should have sufficient knowledge of the common rectal and anal diseases to insure against error in the diagnosis and treatment of such diseases, just as they make it a practice to learn something of the various special diseases, such as of the eye, ear, nose and throat, and of the gastro-intestinal and genito-urinary tracts.

In proctology the technic of examination of the lowest segment of the bowel is simple, and the necessary equipment small. An anoscope, a proctoscope, an inflating bulb, and an electric equipment are required, and every practitioner should familiarize himself with their use. The principles involved in rectal examinations are not difficult, and with very little experience it is possible to examine the bowel up to the sigmoid. The value of this work can be partly appreciated when it is realized that more than 85 per cent of the symptoms referable to this region can be accounted for by pathologic conditions within three inches of the anal orifice.

One need not become experienced in making differential diagnoses of the more obscure conditions found in the bowel. If just enough were learned about the characteristics of a normal rectal mucous membrane to examine above hemorrhoids in order to determine the presence of a cancer before hemorrhoidectomy, a decided step forward would be made.

There are many types of ulcers which affect the rectal mucosa. It will not be possible here to demonstrate their different diagnostic characteristics, but there is one characteristic common to all ulcerations of the bowel: the bleeding of the mucosa when traumatized. Amebic ulcers, tuberculous ulcers, all types from a hyperemia and simple catarrhal or granular proctitis to the most extensive ulcers, will bleed when traumatized. If one is in doubt with regard to the diagnosis, the presence or absence of a lesion may be determined by inserting the anoscope or proctoscope, and rubbing the mucous membrane of the surface of the bowel with a

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cotton swab. A normal mucous membrane will not bleed after such slight trauma.

Malignant ulcers present a characteristic appearance. They are usually single, and the adjacent mucous membrane is not involved, whereas with inflammatory ulcers there is a more advanced involvement of the wall of the bowel, and the tissues adjacent show an inflammatory reaction. In cases of suspected malignancy, specimens for biopsy should not be taken until the day before the proposed operation, since the removal of specimens stimulates the growth of the lesion and hastens metastasis.

In diagnosing high rectal lesions the colon-ray is of inestimable value. Such conditions as carcinoma, diverticulitis, ulcerative colitis, spasm, and stricture can easily be detected in this manner.

Hemorrhoids are the most common of rectal lesions, and may cause many symptoms. This is so true that when a patient consults us, instead of complaining of bleeding, pain, constipation, diarrhea, or any other bowel symptom, he will say, "Doctor, I am suffering with piles." Only too often the doctor agrees with the patient without making an examination. He prescribes a dose of salts and a palliative salve or an ointment for piles, and the patient goes away glad that the doctor did not examine his rectum, and the doctor is satisfied because he did not have to do the disagreeable job.

Statistics based on almost 2,000 cases reveal the fact that 18 per cent of patients who have rectal and sigmoid cancers have been treated or operated on for piles during the period of their symptoms. So, when a patient comes in with the familiar expression: "Doctor, I have the piles", it behooves us to give this patient a fair chance for his life instead of procrastinating and allowing a possibly operable cancer to become inoperable. If we do not find malignancy, we may operate on the hemorrhoids. Any operation which is done carefully will correct this condition. The chief trouble in hemorrhoidal surgery is not the character of the operation, but the fact that there is usually no postoperative treatment. The rectum should be treated after a hemorrhoidectomy in the same manner that any infected wound is treated. The patient's bowels should remain quiet for four days after the operation. It is not necessary to use opiates to "confine" the bowel. The patient will see to it that the bowels do not move. On the fourth night an ounce of mineral oil should be given, and again the follow-

ing morning; after that enough oil should be given to produce one soft stool a day. After each defecation for the following two weeks the bowels should be irrigated with hot water (110° F.), until the water returns clear. Irrigating the wound with a mild medicated solution is very helpful and assists healing.

I would make a plea for more consideration of patients who have rectal complaints, and for the elimination of the physician's antipathy to the examination of the rectum. If a patient says he has piles, he should be examined to see what he means by piles; he may mean anything from constipation to cancer.

DISCUSSION

DR. W. A. FANSLER, Minneapolis: I feel that we are very much indebted to Dr. Buie for calling our attention to the necessity of rectal examinations and wish to congratulate him upon his excellent paper. I most heartily agree with him that it is little short of criminal to supply a patient with some palliative medication without examining him. Rectal examinations are relatively simple. A Kelly proctoscope costing two or three dollars, a pocket flashlight or good sunlight and the patient in knee-chest position is all that is needed for adequate examination of most cases. Expensive electrically lighted pneumatic proctoscopes are not essential to good work. A simple Kelly tube and the vacuum produced by the knee-chest position does the rest. The sooner the general practitioner begins to make rectal examinations as a routine the sooner will we quit having 20 per cent of the cases of rectal cancer report recent operation for hemorrhoids.

"Patent Medicine" Secrecy.—For years the medical profession has insisted that the real reason that nostrum makers keep the composition of their products secret is (1) for the glamour that such secrecy throws around them, and (2) the fact that so long as the public does not know what is in a preparation the advertiser's imagination is given freer play. The "patent medicine" makers, on the other hand, have maintained that their reason for keeping the composition of their products secret is that the formula is personal property, and, if made known, the market would be flooded with imitations. Recently, however, Standard Remedies, the mouthpiece of the "patent medicine" interests, has admitted that the medical profession was right and the "patent medicine" makers wrong. It stated editorially: "It should be remembered that while a developed formula has a great value, it is the trade name, the advertising, the merchandising skill applied in connection with it that creates its valuable good-will. Ten to one a thorough search through books of formulæ will reveal that your own is already known to the medical world. But no one can get the same benefit from it that you have gained unless they spend in merchandising it the same money that you have spent." (Jour. A. M. A., Nov. 11, 1922, p. 1692.)

DIET AND REST IN THE TREATMENT OF CARDIO-VASCULAR DISEASE*

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Much is being written in these days about the chemical balance that is required in the body to maintain health. There must be an alkaline reserve. This is maintained automatically by the kidneys, which eliminate the excess of acid. The urine acidity should not be more than twice that of the body, but it is frequently 100 times that of the body and frequently 1,000 times as acid as the body.† In many of the modern diseases there is a lowering of the alkaline reserve and a condition occurs which we call acidosis, which is the same thing. Why do we hear so much about acidosis, and why is chemical balance lacking in the body? The answer is simple and is comparable to the reason why farmers have poorer crops and more plant disease as they take more and more crops off the soil without replenishing the soil. Virgin upland soil for the most part is alkaline in reaction and crops at first are luxurious and little subject to disease. As repeated crops are taken off they take with them considerable amounts of the bases, lime, phosphorus, soda, magnesia, etc., and the soils become acid, and spindly crops and parasites and disease result.

The same is true in the body. The bases are removed by the modern methods of preparing food and the alkaline reserve is diminished, and we have weaker growth and more disease.

In view of the high urine acidities as mentioned in Doctor Sansum's paper, alluded to above, one might hazard the problematical thought that perhaps in some instances nephritis might be caused by the irritation due to the high acidity of the urine. Experimental work in animals along this line might show some interesting results.

It is believed that excellent and fairly lasting results can be obtained in the diseases mentioned in the title of this paper for the reasons mentioned later. When the alkaline reserve is lowered there is less resistance to infection, which is one of the factors in the cause of these diseases.

The method of treatment outlined below has been

used practically exclusively in the treatment of cardio-vascular disease at the Cascade Sanitarium at Rochester, Minnesota, during the past seven years and a few cases were treated in this manner during the six years preceding that. The classes of cases mentioned include hypertension and diseases of the heart and nephritis. The classification has been somewhat difficult because of frequent association of cardiac disease and nephritis with arteriosclerosis. All cases of hypertension, whether or not associated with heart and kidney involvement, have been classified as arteriosclerosis and the number of cases treated at the Sanitarium during the past seven years was 104 in number. There were eleven heart cases and fifty-six of nephritis. The series of cases mentioned in this paper, while small, deserves consideration from the fact that the method was consistently followed. This does not include numerous other patients who came for other causes and who had slight hypertension or slight cardiac or kidney involvement. Nor does it include numerous other cases with hypotension. With the exception of two cases treated ten and twelve years ago, no mention is made of the cases treated outside of the Sanitarium previous to its establishment seven years ago. Many of the cases were of the severest type, having previously exhausted other methods of treatment.

Practically no drugs were used in any of the cases, the treatment consisting almost entirely of complete rest in bed with large quantities of milk and hot baths and hot packs.

This paper is not a statistical record because many of the cases have not been followed up, but the chief interest lies in the fact that the method has been consistently followed and that the results in most instances have been highly satisfactory. In the beginning the treatment was used empirically but an attempt will be made in this paper to show that this method is based on sound scientific principles. It is well known that, in many cases, rest in bed, and practically no other treatment, will result in a lowering of hypertension and a decrease in the edema in heart and kidney cases, but the results are not so lasting and the general improvement is less than by the method under discussion.

The method, although modified, of course, in different individuals, is, in general, as follows: The patients are kept strictly in bed in the position most comfortable, many patients being unable to lie down in bed. Frequently, nothing is given the

*Presented before the annual meeting of the Minnesota Medical Association, St. Paul, October, 1923.

†Sansum, W. D., Blotherwick, R. N., and Smith, Florence: *Jour. A. M. A.*, p. 883, September 15, 1923.

patients except water and oranges for from one to four days. After the preliminary treatment they are put on milk, beginning, as a rule, with from two to four quarts of rich, raw milk daily (Guernsey usually, but sometimes Holstein). This quantity is increased to from four to seven quarts a day. The feedings are one-half hour apart, from seven o'clock in the morning till eight o'clock at night. The bowels are regulated with enemas. Oranges or orange juice is given twice a day and a dish of prunes or figs at night. Some patients prefer a little lettuce at night. No other food is used.

Constipation is a common complication in hypertension and is possibly a factor in the cause of the disease. It is generally supposed that a milk diet is constipating. Experience with milk in large quantities shows that this is not the case. Perhaps a more correct statement would be to say that constipation is generally overcome when this treatment is used for four weeks or more. The reason for these results is believed to be due to the better general nutrition, and it is quite reasonable to believe that the function of the glandular and muscular coats of the stomach and intestines is improved by the better nutrition, and better blood supply that results. This is also favored by the regular use of abdominal massage with a five-pound cannon ball. Constipation does occur sometimes and even impactions of the lower bowel unless precautions are taken. This complication is avoided by the use of a daily enema, which is used in most cases. No bad after-effects have been observed from the use of enemas, and they are discontinued at the end of the treatment. During the past year, excellent results have been had by using a pint or more of acidophilus milk a day.

In extreme cases with great edema, the effects are most interesting and quite regularly obtained. The following case, although an extreme one, illustrates results that can be obtained:

CASE 1. Mr. K. S., South Dakota; age 54, August 1, 1920. This patient was advised to return to his home, and his family informed that he would probably live but a short time. He insisted on entering the Sanitarium, however. His heart was dilated and he had massive edema, having strips four inches wide sewed into his trousers so that he could get his legs into them. His blood pressure was 224 systolic, 138 diastolic. Urine showed no albumin. Specific gravity 1.012. He was very short of breath. Large doses of digitalis and jalap had been taken.

All medication was discontinued. The first two days he had only oranges and water, the third and fourth days oranges and two quarts of milk, three quarts on the fifth

day, and for the next nine days four quarts a day with orange juice; the next ten days five quarts, on the twenty-sixth day six quarts, and four and five quarts a day for the next week. His weight on entering was 240 pounds, on the seventh day it was 214, a loss of twenty-six pounds in seven days. The fourteenth day it was 205, twenty-first day 204, thirtieth day 203 pounds. At the end of the fifth week he weighed 205 pounds, at which time he left for home. Two months later he wrote that he was feeling fine and was working and that he had gained ten pounds of solid tissue, bringing his weight to normal, 215 pounds. His blood pressure reached 160 systolic, 110 diastolic, by the middle of the third week. Systolic pressure remained at 160, the diastolic came down to 104. He left against advice but said he would return if he had any trouble. At the time of his discharge, his urine showed no albumen, specific gravity 1.020. There was no edema visible.

CASE 2. Miss C., living in Rochester, was treated for six weeks by this method twelve years ago. Single woman. Age 55 at that time. Systolic blood pressure was 245. She had intense headaches and dizziness and heart involvement; was unable to lie in prone position or to walk. Has taken three short courses of this treatment since then. One year ago her blood pressure was 170. She adopted and has raised a child since first treated and has almost constantly managed a boarding house since first treated.

CASE 3. Another case, my mother. Age 68 at that time, ten years ago, had a systolic blood pressure of 245 with kidney and heart involvement, retinal hemorrhages and was nearly blind. Received this treatment for six weeks. Has enjoyed very good health since until one year ago, while away visiting, she had a stroke, paralyzing the right hand and arm. She has partially recovered the use of the arm, and her general health is quite good. She reads almost constantly and writes a good deal with her left hand. Has taken short periods of the treatment several times since the first time.

CASE 4. Mr. S., of Missouri. Age 54, June 1917. This patient had an extremely high blood pressure, frequently reaching 300 or more, or as high as the instrument registered. He had kidney and heart involvement and was unable to be out of bed. He also suffered greatly from insomnia. There was complete loss of sight in the left eye and very little vision in the right, due to retinal hemorrhage. He had the usual method of treatment for six weeks. Before returning home, he was able to have a tonsillectomy done. Later, during the war, he was engaged on a grain commission at Washington, and in one letter his wife stated that "he was as well as a man could be," but that he was working at his usual high tension. Later he worked at his business of grain operator. He died one year ago after a strenuous business trip in the East.

CASE 5. One other patient had a systolic blood pressure going above 300. He was greatly improved by treatment and lived nearly two years. He reported shortly after returning home that he had driven fifty miles to attend a dinner.

CASE 6. Mrs. L., Kentucky. Age 65, January 1921. This patient complained of constant headaches, and dizziness, loss of strength and great anxiety about her condition.

Urine normal, heart fairly good but at times too fast. Blood pressure, 238 systolic and 110 diastolic. Weight 121. Treatment begun in the usual way, taking four quarts of Guernsey milk on the third day and from four to seven quarts daily after that for seven weeks. During this time she gained twenty-four pounds, when she left. On discharge her blood pressure was 150 systolic, 90 diastolic. From a recent report this patient had retained her weight and was quite well.

CASE 7. Mrs. A., Kentucky. Age 60, March 1922. Weight 112. Systolic pressure 160, diastolic 100. Time of treatment, twenty-six days. This patient gained sixteen pounds in twenty-six days. Hemoglobin rose from 64 to 32. At a recent report she was quite well.

CASE 8. Mrs. S., South Dakota. Age 51, March 1918. This patient had usual symptoms of hypertension, headaches, etc. Albumen present. Systolic blood pressure 226, diastolic 130. This patient took five and six quarts daily for thirty-four days. Systolic pressure on seventh day was 150, diastolic 110. At time of discharge the systolic pressure was 132, diastolic 86. The patient was greatly improved in every way. In March 1922 she returned. She had just lost her favorite son and was emotional. Systolic pressure was 220, diastolic 110. She remained five weeks, taking only three quarts of milk a day, as she had increased in weight and did not want to gain. At the time of her discharge she had lost six pounds in weight and the systolic pressure was reduced from 220 to 150, diastolic from 110 to 96.

On account of space only one heart case will be reported.

Mrs. H., Rochester. Age 66. This patient had marked dilatation with massive edema. Weight 174. And was unable to walk. She had exhausted the usual drugs. Pulse 130. Systolic blood pressure 120. The diet was two oranges and three to four quarts of milk a day. The edema was rapidly reduced but the patient was not weighed again until her discharge at the end of five weeks, when she weighed 153 pounds, a loss of twenty-one pounds. Pulse at the time of discharge was 100 and regular, condition of heart and general condition greatly improved. The following winter she had a very severe attack of facial erysipelas, but recovered and was able to do part of her housework until February of this year, when she had an attack of pneumonia and died.

Two nephritis cases died in the hospital. One had a beginning coma on admission and the other practically an anuria, and died in three days. Autopsy showed practically no kidney substance remaining.

During these years there were a number of interesting cases, having hypotension. The same treatment gives marked results in these cases. Briefly the following reports will show the rapid improvement:

CASE 9. Mrs. R., age 39, weight 89.5 pounds. Systolic pressure 84, diastolic 60. On the fourteenth day the systolic pressure was 110, diastolic 70. Four and one-half pounds increase in weight.

CASE 10. Mr. D., Kentucky. Age 33, weight 120. Systolic pressure 84, diastolic 58. At the end of two weeks weight increased ten pounds, systolic pressure 120, diastolic 72. Many other similar illustrations could be given.

The good results in this series can be attributed to the following reasons:

1. Rest—thus avoiding all waste and strain.
2. Abundant or even hypernutrition with a food that has the following advantages: (a) is easily digested; (b) contains all the elements necessary to life and growth; (c) is raw, the chemical and vitamin properties unaltered by heat or by storage; (d) freshness; (e) a food that is rich in phosphates and lime, potash, sodium and chlorine, etc.
3. The large fluid intake which is tolerated and has the advantage of diluting the toxins and washing the tissues.
4. The baths and packs, increasing the elimination by the skin and thus saving the kidneys.
5. The probability that the alkaline reserve is increased as shown by the fact that the urine is frequently alkaline after the patients have been on this diet for a few days.

The advantage of the treatment is that it is intensive. Lasting results can be obtained in a comparatively short time and can be made fairly permanent by repeating the treatment at least yearly and by adhering to the diet prescribed and using one or more quarts of milk daily.

Practically any patient can take milk in large quantities. Of all classes of patients treated, less than 2 per cent could not drink milk in quantity.

At the completion of the period of treatment the patients are given careful instructions regarding hygiene and diet. They have been advised to drink one or more quarts of fresh milk a day. (One patient lived exclusively on milk for more than two years.) They are also advised to eat more of the following foods than they have been accustomed to use: more fruit, especially oranges; more green foods including lettuce, raw cabbage, sauer kraut, and the coarser vegetables that can be eaten raw. They are allowed a small amount of fat meat, fish, etc., two or three times a week, especially advised to select sweetbreads, liver, tripe, etc., avoiding muscle meats. They are advised not to overeat. In addition they are advised to follow suggestions made in the paper, "Factors in Longevity."*

Dr. Sansum's excellent article, mentioned on the

*J. E. Crewe, M.D.: Factors in Longevity. Minn. Med., Oct., 1922, p. 600.

first page of this paper, bears out the advisability of the diet mentioned.

DISCUSSION

DR. JOHN H. MOORE: When I first heard of this method of treating cardio-vascular disease by putting the patients to bed and filling them as full of milk as Dr. Crewe says he does, it seemed almost incredible that a human being could hold that much fluid in as short a period of time as one day. I have tried this thing out myself in the last two years, and while I never succeeded in getting patients to take eight or nine quarts a day, I have gotten some of them to five quarts a day and held them there several days.

I am sorry that Dr. Crewe did not mention one or two things which I think are very important in his method of treatment. It sounds perfectly simple to tell a patient to go home and drink milk. You try it and you find it cannot be done. I know of nothing in the practise of medicine that requires greater care than the treatment of cardio-vascular cases such as Dr. Crewe describes. Constant supervision is the thing, if anything, that will insure success. We know that those patients for whom we prescribe rest and who go to bed will frequently improve without anything else being done for them, but I do believe there is something of value along the lines of what Dr. Crewe in another paper calls hypernutrition and hyperelimination. These patients come in and usually complain of headaches and various subjective symptoms, and it is really surprising how in a few days they will become comfortable.

I have found that where I have had failures in this work has been in the cases where I simply told them how much milk to take and told them a few things as to taking care of themselves and sent them home. They need constant supervision. During the first few days under treatment you will find that the systolic blood pressure will drop rather rapidly, the diastolic not dropping as rapidly, and then towards the end of the first week in treatment the systolic blood pressure will rise again, and as treatment is continued it will gradually settle down to a new low level in favorable cases. I have been unable to account for the rise of the systolic blood pressure towards the end of the first week, and I would like to ask Dr. Crewe if he has experienced that rather characteristic rise. I enjoyed his paper very much.

DR. J. E. CREWE: A study of the lives of aboriginal people shows much of interest in their simpler methods of living. We have probably all marvelled at the wonderful physiques of the people we sometimes see in the movies when they show examples of savage and semi-savage people. These folk live on simple food and are very robust and have little disease for the most part.

Charles Darwin during his trip in South America, many years ago, marveled at the Fuegians, whom he saw near the Straits of Magellan. These were very robust people, averaging more than six feet in height, who were able to undergo great hardships. They lived on shellfish and certain fungi which grew there, and their diet was extremely simple. He also spoke of the people in the western part of Argentina, who lived almost exclusively on a meat diet, averaging about five pounds a day apiece. He states that they were a very hardy and robust people. The Eskimo,

before they were contaminated by white people, had little disease and were robust and lived on a diet consisting almost exclusively of meat and fish.

One can find many wonderful things in some of the old books that we no longer read.

For instance, you remember how Stanley, when he went to rescue Emin Pasha, took five or six hundred negroes from the western coast of Africa, traveling along the Congo through swamp and jungle in a tropical climate. These natives carried from forty to eighty pounds apiece, and he had to obtain their subsistence from what he found on the way. These men were well and contented when they had an abundance of simple foods, such as bananas and cassava. The only difficulties they had were when they were unable to obtain any food, at which times they became sick and had ulcers and intestinal trouble, and many died.

There are many interesting things to be found in books of travel and those written by explorers. These observations should teach us that health is dependent to a large degree on food, and that it is not necessary to have large varieties of food but that it must be fairly abundant and simple, and not "tampered" with as our modern civilized food is.

Colonel McCarristan's experiences while resident for nine years in Northern India are of great interest and very important. Many observations of modern men point to the same thing.

Milk offers a convenient method of overcoming some of the deficiencies of our modern diet, but it is quite likely that results can be obtained by other methods such as recommended by Dr. Sansum and others.

The Commercial Taint in Medical Advertising.—The advertisements of firms that sell apparatus, especially for physiotherapeutics and diagnostic uses, show a tendency to stress the idea that the purchaser of such apparatus will increase his income by impressing the layman with the scientific attainments of the individual who uses it. No decent man in the medical profession thinks of adding to his armamentarium for the purpose of financial gain. An advertiser's appeal to buy a piece of apparatus because of the "psychic effect" which it may produce on the patient is repugnant and insulting. Any firm that thinks it is going to obtain the good will of the medical profession by an appeal to the sordid is sadly mistaken (*Jour. A. M. A.*, July 5, 1924, p. 44).

Cellasin.—Cellasin is sold by the Cellasin Company, Buffalo. Cellasin, then marketed by another firm, was reported on by the Council on Pharmacy and Chemistry about fifteen years ago. It was submitted to the Council with the claim that it was a ferment absorbed unchanged into the tissues, that it cured diabetes mellitus and that it cured tuberculosis and established immunity against this disease. The Council's report at that time brought out that the claims were unwarranted and that it contained, not a ferment, but a spore-producing bacterium which splits sucrose largely into lactic acid (*Jour. A. M. A.*, July 5, 1924, p. 58).

THE COSTO-CHONDRAL GRAFT FOR THE REPAIR OF SKULL DEFECTS*

ADOLPH M. HANSON, M.D.

Faribault, Minn.

Skull defects may be classified as: large or small; pulsating or non-pulsating; frontal, parietal, occipital, and defects of the upper vault. Skull defects requiring graft for repair are usually the result of injuries to the skull and operations made necessary thereby.

The indications for skull graft are: (1) defects which pulsate and cause headache, vertigo, nausea and weakness at rest or on exertion; (2) defects that include live areas, causing irritative lesions because of edema resulting from a pinching of the brain tissue, the symptoms depending upon the area involved; (3) cosmetic reasons.

Let us for a moment consider the existing condition in an old cerebral injury with a pulsating defect over a "live area." For the sake of illustration we may consider a defect over the motor area. Below the defect we have a scarred brain with, perhaps, adherent membranes. If no cyst is present, this healed portion of the brain, on stooping or exertion, is forced into the defect with the following result: a certain amount of edema, more or less, being constantly present, any condition, as epilepsy, spasticity, etc., is aggravated. This is not so noticeable in cases with very small or very large defects, but in those where the defect is large enough to permit of a pinching of the brain tissue, the convexity of the brain tissue when forced into a defect of 3 or 4 cm. by 6 cm. is very marked; whereas, in a large defect the convexity is only slight. The more marked the convexity, the tighter is the pinching process, and the resulting injury and edema of the part involved proportionately greater.

In heterografts, where silver, gold, or celluloid, or any other substance is used, the "man-hole" has simply been given a cover. The defect of the internal table and its space above (5 to 8 mm.) still affords an internal hernia into which the brain may be forced with sufficient force to produce a slight insult sufficient to cause or keep up a slight edema. In this manner, a heterograft may only slightly benefit a chronic localized edema, or not at all. The autograft of costo-chondral cartilage, that is

one-half to two-thirds the thickness of the normal rib, restores the normal thickness of the bony covering and prevents all possibility of pinching. With the internal table restored, a chronic localized cerebral edema will gradually subside.

It was the practice of Shutro in Paris, during the great war, to use thin cartilage grafts, because they were pliable and easily handled, but this has fallen into disrepute because such grafts absorb. The speaker uses a graft from one-half to two-thirds the thickness of the chondral rib. Such grafts do not absorb, but become firmly embedded, affording a dense protective layer that restores the internal table.



Fig. 1. Before operation.

The technique of the operation is briefly as follows: The head is painstakingly shaved and prepared by washing with soap and sterile water; sponged with ethyl alcohol and dried by sponging with ether. The site of choice for securing the graft is over the costo-chondral cartilages of the

*Read before the Southern Minnesota Medical Association, Mankato, May, 1924.



Fig. 2. Skull defect exposed.



Fig. 3. The cutting of the costo-chondral graft.

fifth, sixth and seventh ribs, either side. This is prepared in the same way. Using a one-half per cent novocain solution to which one thirty-second grain of adrenalin chloride has been added per 60 c.c., a block of scalp about the defect is injected; also, a block of skin, including the deeper structures, at the site selected for securing the graft. The old defect is exposed, employing a tripod incision, exposing well beyond the margins of the defect, when possible, carefully separating the galea from the dura. The dura, adherent to the margins of the defect, is freed by the use of a dural separator. The graft is now secured and trimmed to fit the defect. Taking care that the head wound is dry and all clotted blood removed, the defect is carefully sponged with ethyl alcohol and the graft laid on the dura with the smooth uncut surface inward. The scalp is now closed in layers, using interrupted No. 0 or 00 chromic gut sutures in the

galea and interrupted silk sutures in the scalp. A pad of sterile gauze is placed directly over the defect and graft and secured by adhesive strips in such a manner as to keep the graft firmly in place and prevent bulging until it becomes firmly adherent and embedded. This pad is changed and carefully readjusted in three or four days, when the scalp sutures are removed; again one week later; and, again ten days later. At the end of three weeks the graft has usually become firmly embedded and all dressings are removed. In large defects in the parietal or occipital regions, the pad should be kept in place for six weeks.

The following case report with illustrations is submitted:

Case History No. 10621. W. F. O. Age 28 years. Male. Single. White. American.

While driving an automobile on Jefferson Highway near Faribault, Minnesota, on Sept. 20, 1923, drove off the road



Fig. 4. The costo-chondral graft in place.

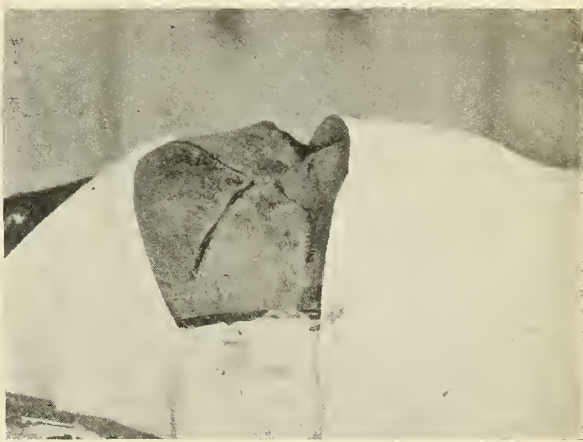


Fig. 5. The galea sutured.



Fig. 6. Six weeks post-operative.

striking a culvert and was thrown violently against the handle of the windshield wiper. He was found in the automobile bleeding from the forehead, nose and mouth

by a farmer about 6 A. M. No history of accident obtainable from patient.

Diagnosis: Compound, comminuted fracture of the frontal bone, including the right orbit and most of frontal sinus; intra-cranial hemorrhage and severe concussion; fracture of both maxillary bones with displacement and separation from normal articulations.

Treatment: Lumbar puncture, intra-spinal pressure 18 mm. mercury, cerebro-spinal fluid bloody.

Operation, September 20, 1923, at 7:30 A. M. Trepanation of skull with removal of comminuted bone fragments, pieces of windshield and vulcanized rubber, including the mesial half of the right orbit. Sub-temporal decompression right side.

The teeth of the upper and lower jaws were brought into correct articulation and held in place by a four-tailed bandage by Dr. J. A. Hanson, D.D.S. This was carefully readjusted and the articulation inspected twice daily.

The patient's mentality began to clear up on the fourth day post-operative and the patient had an uneventful recovery, leaving on the twentieth day post-operative.

On January 16, 1924, the skull defect was exposed for the purpose of doing a skull-graft, but the remaining portion of the frontal sinus was found to contain fluid, resembling a milky serum. The external wall of the remaining portion of the sinus was removed by rongeurs, the lining of the sinus on the posterior wall removed by a curette and the posterior wall swabbed with phenol. The skin was closed with drainage. The patient was allowed to leave the hospital on the fifth day post-operative.

On February 5, 1924, the skull defect was again exposed and portions of the costo-chondral cartilages of the seventh, sixth and fifth ribs removed for the graft. The sutures were removed on the third day post-operative and the patient permitted to leave the hospital on the eleventh day.

These operations were performed under local anesthesia.

Illustrations of this case are shown as they most clearly demonstrate the technique of this operation.

POISONOUS COSMETICS

Numerous cases of poisoning due to the use of cosmetics containing harmful ingredients are reported in a recent article by Cole in the Journal of the American Medical Association.*

Lead is apparently frequently used in hair dyes, face enamels and cheap face powders and their use has often resulted in severe lead poisoning, in one case with fatal results. Mercury is another dangerous metal sometimes found in hair dyes, but more often in face cream and skin bleaches. The concentration of the mercury compound is frequently far greater than is commonly employed for disinfecting purposes. Bismuth is sometimes used in the preparation of so-called rice powders, the use of which gives rise to clamminess of the skin, nausea and spasms. Arsenic has occasionally been found in hair dye but is presumably not a common ingredient. Wood alcohol was found by one analyst in 33 per cent of the toilet waters exam-

ined. Silver compounds and pyrogalllic acid are frequently used in the manufacture of hair dye and may endanger the patient in the same way as lead or mercury. The metals calcium and barium are largely employed in the manufacture of depilatories and are apt to cause skin eruptions. The same may be said of many of the deodorants used by women.

According to the writer the most dangerous drug of all those used in cosmetics is paraphenyldiamin, which, because of its irritating character, should not be allowed in hair dyes. It causes an intense skin eruption which is persistent, often lasting for weeks. Several deaths are reported as being due to the use of this chemical.

The dangers from the use of cosmetics are of two types—first the mechanical obstruction of the pores of the skin and second, the destructive action of certain harmful ingredients; the amount of harm done depending on the particular chemical used, the duration of its application, the area to which it is applied, and the susceptibility of the person using it.

*June 14, 1924, page 1909.

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EDITORIAL

Medical Mutations

With the recent development of the scientific side of medicine the undergraduate medical course has been lengthened until now a minimum of seven years faces the medical prospect as he leaves high school. And if the academic degree, the desirability of which for the professional man has been and always will be a matter of taste, is first obtained, nine years are necessary before even a license to practice medicine is obtained. It is no wonder that postgraduate courses along special lines have been proportionately short. As medical science develops still more is the medical course to be further lengthened in an endeavor to cram all medical knowledge into the undergraduate's head? Even today it is impossible for the graduate to keep thoroughly abreast of progress in a specialty to say nothing of the whole field of medicine. It is apparent that we are approaching the time, if we have not already reached it, when training in the specialties will have to be more emphasized and the time period required for the M.D. degree kept stationary or even shortened.

This whole subject was very comprehensively presented by Dr. Pusey, president-elect of the American Medical Association, in his recent address* to the House of Delegates. Dr. Pusey suggests that the present seven year requirement be cut to four and a half years, these to consist of three years of medical training and a year and a half at least of internship.

This is a radical proposal and would mean the elimination of much from the present undergraduate curriculum. Undergraduate work includes much that could very profitably be transferred to postgraduate courses and some work that might to advantage be left out entirely. Practice in the art of medicine—that is, the actual performance of things medical—should not be abbreviated. If shortening the undergraduate course will result in a more poorly qualified graduate, such a step should not be taken. No change should be made which will undo the remarkable improvement in medical education brought about since 1900 largely through the work of the Council on Medical Education and Hospitals of the American Medical Association.

Shortening the undergraduate medical course to the extent suggested by Dr. Pusey would attract more young men to the medical profession. Is this necessary or advisable? There is no dearth of applicants for admission to medical schools as far at least as local conditions are concerned. A shorter course, would, however, be of advantage to the poor boy.

There is some room for argument as to whether there is an actual scarcity of physicians today. The various cults, however—chiropractic in particular—are turning out a horde of half educated so-called doctors and a very considerable proportion of the population is patronizing them. In this connection we wish to recall the result of the investigation made by Dean Lyon of the University of Minnesota Medical School, which appeared as an editorial in the February, 1923, number of MINNESOTA MEDICINE. His conclusion was that “in not a single place do we find an osteopath or chiropractor serving the people with no regular physician available” and he makes that point that irregulars “are not taking the place of the doctor but are additional to him.” Whether turning out more physicians would remedy the situation and supply a demand now met by the irregulars is open to question.

It is interesting in this connection to consider the

*Jour. Am. Med. Assn., June 14, 1924, vol. 82, p. 1960.

subject of medical education in England. There are some features of their system of granting degrees which it might be well to imitate although there are certainly others which it would be well to avoid.

The lowest degree entitling a physician to practice in Great Britain is the L.S.A. (Licentiate of the Society of Apothecaries). The next degree in order is the L.R.C.P., M.R.C.S. (Licentiate of the Royal College of Physicians and Member of the Royal College of Surgeons). This is known as the "conjoined degree." Examinations are held each three months and the subjects are divided into three groups—medicine, surgery, and gynecology and obstetrics.

For the doctor who elects to devote his attention along medical lines, examination is taken for the M.R.C.P. (Member of the Royal College of Physicians). This is the highest degree obtainable by examination and indicates special attainment. The degree of F.R.C.P. (Fellow of the Royal College of Physicians) is purely honorary and is granted for outstanding achievement in the medical field.

If surgery is elected, examination for the degree of F.R.C.S. (Fellow of the Royal College of Surgeons) may be taken. This is a most rigid examination covering anatomy, physiology and surgery and the degree means something.

The degrees of M.B. (Bachelor of Medicine) and M.D. (Doctor of Medicine) are granted in England and rank higher than the conjoined degree but frequently are not possessed by those having the degree of F.R.C.S.

In England the time element spent in study does not figure as prominently as in our country. Examination is all-important. The undesirable feature of cramming is therefore more in evidence.

Our titles of F.A.C.S. and F.A.C.P. are direct imitations of the British degrees. The rapidity with which our titles have been granted in an apparent effort to catch up with our English cousins has distinctly detracted from the standing of the titles and yet the move is generally admitted to be in the right direction.

The desirability of establishing degrees for postgraduate work which will signify special attainments is becoming more and more apparent. Such degrees would spur the practitioner on to perfect himself along certain lines and would draw the line of demarcation more clearly between specialist and general practitioner.

The proposition of enacting fundamental changes in medical education in this country is a vital question and is eliciting considerable discussion as a result of Dr. Pusey's address. The problem is, of course, one for medical educators to solve.

Recent Distribution of Physicians in Minnesota

Attention is frequently called to that fact that physicians are congregating in the cities and that the rural districts are consequently suffering from lack of medical attention.

Figures are not at hand showing the distribution of physicians in cities and rural communities in Minnesota. Since the first of the year, however, the medical graduates of the University of Minnesota for the past ten years have been located by Dean Lyon's office. The following table has been drawn up to show the distribution in towns or rural districts of the recent graduates irrespective of whether they located in Minnesota or other states. Comparison is made with the distribution of the population in Minnesota. Possibly the comparison should have been limited to the physicians locating in Minnesota.

	No. of	Percentage	Percentage
Size of city	graduates	of graduates	of total population
Less than 5,000...	164	31	61
5,000 to 50,000...	92	17.5	9
50,000 or over...	239	45.5	30

Population figures have been obtained from the 1920 census and fractions have been omitted. Six per cent of the recent graduates could not be located, had died, etc. A number of graduates are taking postgraduate work in Rochester or are associated with the Mayo Clinic and this accounts for some of the relative high percentage of recent graduates (17.5) in cities of 5,000 to 50,000 population. It is interesting to speculate what percentage of the graduates who are now at Rochester would have sought country locations and thus tended to relieve the dearth of rural physicians, had not Minnesota been possessed of the Rochester clinic.

Specialism is bound to be limited to localities where there are at least several doctors. Patients will ever be referred from the rural districts to the larger centers of population for special medical attention. Rural communities are therefore not entitled to the same ratio of doctors as the towns and cities.

Further, doctors in the towns of 5,000 population

and over care for a certain portion of the rural population in the immediate neighborhood.

It may be reasonably concluded from the above figures that as far at least as Minnesota is concerned there is a tendency for recent graduates to avoid rural locations.

Smallpox

There are few infectious diseases that can be so largely prevented as smallpox. Yet propaganda will probably always have to be maintained in order to keep the population thoroughly vaccinated. While a small percentage of people in this country are opposed to the idea of vaccination against smallpox because of ignorance, prejudice or simply anti turn of mind, most of the lack of immunization is due to neglect.

In a circular recently compiled by Dr. McDaniel, of the Division of Preventable Diseases of the State Board of Health, and sent to the various health officers throughout the state, the smallpox situation in Minnesota is clearly set forth. It seems that a laborer from Canada introduced a malignant strain of the disease into Duluth in January of this year. The infection spread through St. Louis, Carlton, Aitkin and Lake counties and gained a foothold in Wisconsin. Up to August first there had been 193 cases with forty deaths in Minnesota.

Certain points about smallpox should be emphasized.

1. Smallpox in rare instances can be contracted a second time.
2. Smallpox may be contracted in spite of a successful vaccination. It is even possible for smallpox to develop where a successful vaccination has been obtained within seven years although this is rare.
3. The older the vaccination scar the less immunity is present.
4. Smallpox developing in successfully vaccinated individuals is milder than in the unvaccinated. A virulent strain may not lose its malignancy because of mild manifestations in a vaccinated individual.
5. Children as a rule react less severely to vaccination than adults.

Reports of numerous outbreaks of smallpox throughout the country merely emphasize the importance of continually reminding our clientele of the necessity of keeping immune against smallpox.

MISCELLANEOUS

STATE FAIR EXHIBIT

The State Medical Association and the University have for the first time been invited to put on a health exhibit conjointly at the State Fair this month. The joint action is a particularly happy one as the University has the best facilities conceivable for getting up a worthwhile exhibit of this sort, and the collaboration of the physicians of the state assures the proper sort of display. This sort of activity is no new departure for the University. At the Minneapolis Health Exhibit, held in conjunction with the last Minneapolis Clinic Week, the University under the supervision of Dr. W. A. O'Brien did itself proud in the character of its display. The fact that Dr. O'Brien has charge of the State Fair Exhibit assures its success and was a factor in obtaining the appropriation from our Association to cover incidental expenses.

The following excerpt from a letter to Dr. F. J. Savage, chairman of our Public Health Committee, indicates the educational nature of the exhibit:

July 31, 1924.

Dear Dr. Savage:

The final arrangements for our space at the State Fair have been completed. We have been given 60 feet in the lower section on the right side. There will be a large sign placed over the exhibit with the lettering, "University of Minnesota Medical School and Minnesota State Medical Association."

The booths will be divided as follows: One large central booth 16x10 feet. In the front of this exhibit there will be a 10-foot table with demonstration of the circulation of the blood through the web of a frog's foot; a mechanical moving thorax; a turtle's heart beating outside the body in a bell-jar; a small hand model of the action of the diaphragm in breathing, containing a pair of rabbit's lungs in fresh condition. The idea of this exhibit is to convey an impression of the scientific nature of the methods used by physicians in examining patients. In the rear of the booth there will be two large modern manometer blood pressure machines. In the center of the booth at the rear there will be two vital capacity spirometers. Signs calling attention to the value of periodic physical examinations will be placed.

The other booths will be 11x10 feet. In one we will use a display of panels calling attention to the things every layman should know about the early recognition of cancer, as, for example, "a lump in the breast is the chief early sign of cancer," etc. In the front of this booth actual specimens of cancer of the skin, breast, uterus, stomach and rectum will be on display. We will distribute literature provided by the American Society for the Control of Cancer.

The third booth will be used for tuberculosis. In this exhibit we intend to put over the idea that the earlier tuberculosis is detected the greater the chances for arrest. As a background of this exhibit we will use four x-ray shadow boxes showing normal lung and incipient, moderately advanced and advanced tuberculous lungs. Pathologic specimens corresponding with these stages will be placed in front of the shadow boxes on a lower shelf. On either side will be two panels, one showing a chart compiled by the Prudential Life Insurance Company in regard to the probability of cure and, on the other side, placards

advising people to consult their physicians early in regard to any chest trouble.

The fourth booth will be devoted to the things every mother can do for her children at home, that is, assure proper growth and prevent goiter. In the front part of the booth there will be an exhibit of white rats, properly labeled, showing the effects of faulty feeding. In the rear will be a display calling attention to the fact that the water of Minnesota is deficient in iodine and that such deficiency is the cause of goiter. In the center will be a display of the means of prevention of goiter. On the rear wall will be two maps showing the distribution of iodine-deficient water and the percentage of goiter in drafted men.

The fifth booth will be devoted to diphtheria and smallpox. Either a display of methods of growing diphtheria bacilli will be made or the organisms will be shown under the microscope. The propaganda we wish to put over in this section is that every person should be immunized against diphtheria and smallpox.

We are arranging to have a full quota of advanced medical students in charge of the booths at all hours. We trust that these plans will meet with your approval.

Sincerely yours,

WM. A. O'BRIEN.

RESOLUTION ADOPTED BY THE OLMSTED COUNTY MEDICAL SOCIETY, JULY 1924

WHEREAS, vaccination against smallpox and typhoid fever has been attacked by various pseudo-scientific societies and in some instances by the public press as being ineffective in the prevention of these diseases and dangerous to the health of those vaccinated, and

WHEREAS, the experience of the medical department of the United States Army has proved conclusively that, in the case of typhoid fever, vaccination is a safe and dependable measure, responsible for the saving of many thousands of lives during the world war, as is shown by a comparison of the typhoid rate during the Civil War before anti-typhoid vaccination was known, and the rate during the world war, indicating that, had the former rate prevailed, over sixty thousand Americans would have died of the disease instead of the actual number, which was barely two hundred, and

WHEREAS, general neglect of vaccination against smallpox is leading to a greatly increased prevalence, and in some places to its appearance in epidemic and in virulent form, and

WHEREAS, there is positive proof as shown by the records of state and municipal health departments that vaccination with re-vaccination will prevent smallpox, and

WHEREAS, vaccination properly performed and cared for carries no appreciable risk to the health of those vaccinated, as proved by the extensive experience of army surgeons who have treated hundreds of thousands of persons without a death, therefore

BE IT RESOLVED that the members of the Olmsted County Medical Society hereby publicly endorse vaccination as a most effective means for the protection of individual and community health and further that they go on record to the effect that vaccination is a harmless procedure and conducive to public welfare.

OBITUARY

DR. WARREN L. BEEBE

After an illness of seven months, Dr. Warren L. Beebe, well known medical practitioner of St. Cloud, died Wednesday afternoon, August 13, at the Northern Pacific hospital at St. Paul. Dr. Beebe was 76 years of age.

Dr. Beebe was born at Belpre, Washington county, Ohio, March 16, 1848, son of Dr. William and Elizabeth (Rathbone) Beebe. He attended the common schools of his native town and in 1870 was graduated from Marietta college in Marietta, O. From the days of his earlier boyhood it was his determination to follow in the footsteps of his distinguished father. He graduated from the Ohio Medical college at Cincinnati, O., in 1873, with the degree of M.D., a mark of real merit in those days when so many physicians received their training in the office of some general practitioner. Desiring still further to master the profession, Dr. Beebe entered the Bellevue Hospital Medical college, from which institution he was graduated in Centennial year. With this equipment he practiced in his native village under the direction of his father. He also practiced in Barlow in the same state. In 1878 Dr. Beebe came to Minnesota and located in St. Cloud, which city has since been his home.

Dr. Beebe was devoted to his profession, kept abreast of the latest developments in science, chemistry and medicine, and had a reputation as high authority in such matters. His excellent mental powers, his long experience, and his rigid training as well as his upright character and sympathetic nature are among the factors which contributed to his extraordinary success in the treatment of disease and his skill in surgery. Throughout his residence in St. Cloud he was a potent factor in the professional and civic life of the city. He belonged to the Stearns-Benton Medical Society, of which he was one of the founders, to the Minnesota State Medical Association, and to the American Medical Association. In 1890-91 he was president of the state association, and by all of these bodies he has been repeatedly placed in position of honor. He also affiliated with the Masonic body, the Elks and the Knights of Pythias. He was social in his tastes and had a large circle of friends throughout the state. For many years he was local surgeon for the Northern Pacific and Great Northern railways. Politically he several times served the city of St. Cloud as health officer and for a number of years he was United States pension examiner.

Dr. Beebe was married December 28, 1876, to Miss Maria Harte, at Marietta, O., who survives.

DR. H. M. LUFKIN

Dr. H. M. Lufkin, a practicing physician in St. Paul for thirty-seven years, died Sunday morning, July 6, at St. Luke's hospital, following an illness of six months.

Dr. Lufkin was born in Shelbyville, Illinois, in 1860. He was a graduate of the University of Michigan, Illinois State Normal School, Hahnemann Medical College, Philadelphia, and New York City College. Dr. Lufkin was also a student at the New York Polyclinic and in Vienna for two years.

Dr. Lufkin was formerly connected with the staff of the

medical school of the University of Minnesota, president of the Minnesota State Homeopathic Society, a member of the staff of St. Luke's and of St. Joseph's hospitals, St. Paul. At the time of his death he was a member of the staff of the City and County hospital. He was an active member of the Ramsey County and Minnesota State Medical Associations.

Surviving Dr. Lufkin are his widow, two daughters, Bernadine and Anne Virginia; three sons, Hamilton, Nathaniel and Charles Dexter, all of St. Paul; two brothers, Frank N., and Charles D., of Hawaii; a brother and sister, Dudley C., and Charlotte O., of Normal, Illinois.

DR. WALTER COURTNEY

Walter Courtney was born on the east shore of Lake Huron sixty-six years ago. He was of hardy Scotch ancestry and was one of a large family of children. His early training was received in the nearby country schools and in the Canadian forest that bordered the home farm. He was proud of his prowess with an ax. The amount of cordwood that he "got out" during the winter that preceded his matriculation in medical school was one of the exploits of his life.

He was a member of the class of '83 that graduated from the University of Michigan; a classmate of W. J. Mayo and Franklin Mall. He engaged in general practice for a short time, but was made Chief Surgeon of the Northern Pacific Railway in charge of the hospital that was maintained at Brainerd. This institution was one of the first to be maintained exclusively for the care of industrial employees, and was Doctor Courtney's life work.

He was elected President of the Minnesota State Medical Society and served in that capacity for one year. He was given the honorary degree of Master of Arts by his Alma Mater in 1908.

He lived his professional life as a country surgeon, and in that capacity was called upon to treat a great variety of ailments and to meet all emergencies alone. He did his work honestly and well. He was, even after he retired from active practice, greatly interested in medical matters. He was a firm believer in strict medical ethics and the highest professional ideals.

His death, which occurred June 23rd, 1924, has taken from the profession an honored member and from many of us a good friend.

A. W. IDE, M.D.

DR. C. L. GOTHAM

Dr. C. L. Gotham, for several years a member of the staff of the St. Paul Hospital, died Monday, April 28, at his home in St. Paul, following a short illness.

Dr. Gotham was born in 1866 at Weyauwega, Wisconsin. He attended the state normal school at Oshkosh, graduating in 1898. He received his degree as doctor of medicine from Rush Medical College in 1911, following which he served a year's internship at the Swedish Hospital in Minneapolis. In 1916 Dr. Gotham took up his practice in St. Paul, where he continued in practice until the time of his death.

Dr. Gotham is survived by his wife, Della Faulkner Gotham, and daughter, Stella Mae.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA STATE MEDICAL ASSOCIATION

The annual meeting of the Minnesota State Medical Association will take place at St. Cloud, Wednesday, Thursday and Friday, October 8, 9 and 10, 1924.

The local committee on arrangements, of which Dr. C. B. Lewis is chairman, is completing arrangements for the entertainment of members of the association at the meeting. Physicians are particularly urged to bring their ladies as entertainment is to be provided. This year the banquet is to be omitted and Thursday evening is to be purely a social affair.

The Council will meet at 10 A. M. and the House of Delegates at 2 P. M., Wednesday, October 8th.

Following are the local committees:

Committee on Exhibits—H. W. Goehrs, Chairman, I. E. Bowling, H. F. Clark.

Committee on General Entertainment—Wm. Friesleben, Chairman, P. E. Stangl, T. N. Fleming.

Committee on Hotel Accommodations—J. H. Beaty, Chairman, J. C. Boehm.

Committee on Entertainment of Ladies—J. P. McDowell, Chairman, C. A. Rathburn.

Committee on Lantern Slides—M. J. Kern, Chairman, C. F. Brigham.

Committee on Reception of Members—W. L. Beebe, Chairman, A. D. Whiting.

Committee on Telephone Service—F. H. Stangl, Chairman, Julius Adams.

Committee on Meeting Places—C. S. Sutton, Chairman, J. S. Dunn.

Sign Committee—H. McGibbin, Chairman, L. P. Adams.

Golf Committee—J. J. Gelz, Chairman.

Officers of the Association are:

President—Archibald MacLaren, M.D., St. Paul.

First Vice President—E. T. Sanderson, M.D., Minneota.

Second Vice President—F. J. Hirschboeck, M.D., Duluth.

Third Vice President—C. W. Bray, M.D., Biwabik.

Secretary—Carl B. Drake, M.D., St. Paul.

Treasurer—F. L. Beckley, M.D., St. Paul.

PRELIMINARY SCIENTIFIC PROGRAM

THURSDAY MORNING—OCTOBER 9TH

MEDICAL SECTION

1. DIFFERENTIAL DIAGNOSIS OF PULMONARY DISEASE—
M. George Milan, M.D., Warren.
2. ARTIFICIAL PNEUMOTHORAX IN ACUTE LUNG ABSCESS—
Everett K. Geer, M.D., St. Paul.
3. LIVER FUNCTIONAL STUDIES IN CLINICAL JAUNDICE—Carl
Hartley Greene, M.D., Rochester.
4. DIABETES IN CHILDREN—
F. W. Schlutz, M.D., Minneapolis.
5. PRACTICAL ELECTROCARDIOGRAPHY—
Harold E. Richardson, M.D., St. Paul.
6. THE ELECTROCARDIOGRAM IN THE MANAGEMENT OF
HEART DISEASE—E. T. F. Richards, M.D., St. Paul.
7. AMEBIASIS—T. B. Tuttle, M.D., Veterans' Bureau.

SURGICAL SECTION

1. THE TREATMENT OF SEVERE INJURIES OF THE SCALP—
Orville N. Meland, M.D., Warren.
2. OBSTRUCTIVE JAUNDICE AND STUDIES IN LIVER FUNCTION—H. Waltman Walters, M.D., Rochester.
3. FOREIGN PROTEINS AS THERAPEUTIC AGENTS IN THE TREATMENT OF ACUTE OCULAR INFLAMMATION—
John F. Fulton, M.D., St. Paul.
4. PREOPERATIVE TREATMENT OF THE PROSTATIC—
Gilbert J. Thomas, M.D., Minneapolis.
5. ACUTE OSTEOMYELITIS IN CHILDREN—
Carl C. Chatterton, M.D., St. Paul.

THURSDAY AFTERNOON—OCTOBER 9TH

GENERAL SESSION

CANCER SYMPOSIUM

1. CARCINOMATA AS SHOWN BY PAPER MODELS RECONSTRUCTED FROM SERIAL SECTION—
Margaret Warwick, M.D., St. Paul.
2. SOME UNUSUAL PATHOLOGIC FEATURES CONCERNING CANCER—Harold Robertson, M.D., Rochester.
3. THE DESTRUCTIVE AND CONSTRUCTIVE SURGERY OF MALIGNANCY—Harry P. Ritchie, M.D., St. Paul.
4. THE RELATIVE VALUE OF SURGERY AND RADIOTHERAPY—
W. J. Mayo, M.D., Rochester.
5. WHAT THE LAITY SHOULD KNOW ABOUT CANCER—
William A. O'Brien, M.D., Minneapolis.

FRIDAY MORNING—OCTOBER 10TH

MEDICAL SECTION

1. HEMORRHAGIC PURPURA—H. Z. Giffin, M.D., Rochester.
2. SOME OBSERVATIONS CONCERNING TIC DOULOUREUX AFTER SIXTEEN YEARS' EXPERIENCE—
Charles R. Ball, M.D., St. Paul.
3. NEWER IDEAS ON THE ROLE OF INFECTIONS IN NERVOUS DISEASE—W. H. Hengstler, M.D., St. Paul.
4. DIATHERMY IN VASCULAR CIRCULATORY DISTURBANCES AND ARTHRITIS—A. E. Flagstad, M.D., St. Paul.
5. CUTANEOUS PICTURE OF LATE SYPHILIS—
Paul A. O'Leary, M.D., Rochester.
6. DISEASES OF THE PANCREAS: DISCUSSION OF THE IMPORTANT SYMPTOMS AND FINDINGS WITH REPORT OF CASES—Moses Barron, M.D., Minneapolis.

SURGICAL SECTION

1. ACCIDENTS IN SINGLE INGUINAL HERNIA—
E. C. Robitshek, M.D., Minneapolis.
2. THE SILENT ANTRUM—
W. L. Burnap, M.D., Fergus Falls.
3. ARTHROPLASTIES—M. S. Henderson, M.D., Rochester.
4. FRACTURES OF THE SPINE—
Emil F. Geist, M.D., Minneapolis.
5. RELATIVE MERITS OF THE DIFFERENT SURGICAL PROCEDURES FOR DUODENAL ULCER—
Donald C. Balfour, M.D., Rochester.
6. TRACING INFECTIONS IN A SURGICAL SERVICE—
Arthur N. Collins, M.D., and Dr. Ritz, Duluth.

FRIDAY AFTERNOON—OCTOBER 10TH

GENERAL SESSION

1. INSTALLATION OF OFFICERS
2. EXPERIMENTAL WORK WITH THE TESTIS—Carl R. Moore, M.D., Chicago
3. CHILD GUIDANCE—
Lawson G. Lowery, M.D., Minneapolis.
4. PREVENTION OF GOITER—O. W. Rowe, M.D., Duluth.
5. DIFFERENTIAL DIAGNOSIS OF PRE-ECLAMPTIC TOXEMIAS AND NEPHRITIC TOXEMIAS OF PREGNANCY—
Albert G. Schulze, M.D., St. Paul.
6. PERIODIC PHYSICAL EXAMINATIONS—
H. W. Cook, M.D., Minneapolis.
7. HEALTH MOVIE

TRI-STATE DISTRICT MEDICAL ASSOCIATION

The annual meeting of the Tri-State District Medical Association, which this year is known as the Inter-State Postgraduate Assembly of America, will take place at Milwaukee, October 27 to 31, inclusive.

The preliminary program appeared in the August issue of MINNESOTA MEDICINE and space does not permit a repetition of the program. The program, which begins daily at 7 A. M. and continues well into the night, includes the names of eminent physicians and surgeons from all over the United States and Canada. Mention a prominent member of the profession and his name is very likely to appear on the program. This association has been growing stupendously because of the remarkable programs arranged. Only the larger cities can afford accommodations for the literally thousands of physicians who attend.

The following is a partial list of distinguished foreign guests who will be present and take part on the program: Professor Theodore Tuffier, Professor of Surgery, Faculty of Medicine, Paris, France.

Mr. A. J. Walton, London, England.

Dr. John Hunter, University of Sydney, Sydney, Australia.

Dr. N. D. Royle, Craginsh, Sydney, Australia.

R. Hamilton Russell, Esq., F.R.C.S., Melbourne, Australia.

Dr. Carrick Hey Robertson, F.R.C.S., Auckland, New Zealand.

Dr. Ralph Worrall, Sydney, Australia.

Dr. H. B. Devine, Melbourne, Australia.

Dr. J. S. Elliott, Wellington, New Zealand.

The banquet will terminate the session and will be addressed by the following distinguished speakers:

Monsieur J. Jusserand, French Ambassador to United States, Washington, D. C.

Sir Arthur William Currie, Vice Chancellor of McGill University, Faculty of Medicine, Montreal, Canada.

Dr. Nicholas Murray Butler, President of Columbia University, New York, N. Y.

Professor Theodore Tuffier, Professor of Surgery, Faculty of Medicine, Paris, France.

Rear Admiral Edward R. Stitt, Surgeon-General of United States Navy, Washington, D. C.

Major General Merritte W. Ireland, Surgeon-General of United States Army, Washington, D. C.

LYMANHURST AND PARKVIEW STAFF MEETING

Owing to the necessity of postponing the regular monthly meeting for August of the Lymanhurst and Parkview staff members, the program announced for the August meeting will be given at the regular meeting to be held at the Lymanhurst School, 1800 Chicago Avenue, Minneapolis, Tuesday evening, September 23, at 7 o'clock.

The following program will be given:

"Review of Chemistry of Tuberculosis," Dr. W. P. Larson.

"Review of Calmet's Recent Work in Tuberculosis," Dr. W. P. Larson.

"Recent Developments in Bacteriology and Serology in Tuberculosis," Dr. Montank.

"The Pathology of Tuberculosis," Dr. Kano Ikeda.

All persons interested in tuberculosis are invited to attend these meetings and participate in the discussions.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

The annual meeting of the Northern Minnesota Medical Association held this year in Duluth, August 4 and 5, was a great success from start to finish. The clinics held each morning were short and snappy and a military precision characterized their management. This prevented any dragging, or napping on the part of the audience. None of the clinics were operative but illustrative cases were presented.

The lunches, one at St. Mary's Hospital given by the hospital, and the other at the Kitchi Gammi Club, tendered by the local profession, were greatly enjoyed. The evening society dinner was addressed by the retiring president, Dr. W. L. Burnap, of Fergus Falls, and Dr. H. Gideon Wells, of Chicago, gave a most interesting address on cancer in its relation to heredity. Those who have heard him speak came away convinced by his experiments and conclusions.

The officers of the association are to be congratulated on the fine program.

OF GENERAL INTEREST

Dr. James B. Vail has disposed of his practice at New York Mills and is now located at Henning.

Dr. A. L. Kusske, formerly of Minneapolis, has moved to New Ulm for the practice of his profession.

Dr. and Mrs. Earl Jamieson, Walnut Grove, returned recently from a motor trip through Yellowstone Park.

Dr. J. A. Cosgriff recently moved from Lamberton to Mankato, where he is to be associated with the Mankato Clinic.

Dr. Milton J. Geyman, formerly of Browerville, will take up a fellowship in Roentgenology at the University of Minnesota this fall.

Dr. Gaius C. Harmon has announced the opening of his office at 2267 Como Avenue West, St. Paul, for the practice of his profession.

Dr. and Mrs. Edward C. Gager, of St. Paul, sailed August 15 from Montreal on the Montclare for Europe, where they will spend a year.

Dr. Wm. A. Meierding, Springfield, with Mrs. Meierding and their two sons, spent the latter part of July touring northern Minnesota.

Dr. C. C. Walker has moved from Raymond to Lamberton, where he was formerly located before taking up his practice at Raymond.

Dr. F. H. K. Schaaf, of Minneapolis, is spending two months in Berlin and Koenigsberg. He expects to return some time in October.

Dr. S. N. Mogilner and family, St. Paul, left July 10th, for a year's stay in Vienna, where Dr. Mogilner plans to take a course in postgraduate study.

Dr. L. H. Fowler, who has been associated with the Mayo Clinic, Rochester, for the past few years, is now located in the Andrus Building, Minneapolis, for the practice of his profession.

Dr. and Mrs. J. S. Shrader, of Springfield, have just returned from a three weeks' tour of the western states, including a trip through Yellowstone and Glacier National Parks.

Dr. Karl C. Wold became associated August 1 with Drs. Larsen, Binger and Wheeler, 1027 Lowry Bldg., St. Paul. Dr. Wold limits his practice to diseases of the eye, ear, nose and throat.

Dr. E. W. Fahey, St. Paul, was elected supreme physician of the Knights of Columbus at the forty-second annual convention held in New York City recently. Dr. Fahey received the election by a plurality of eighty-one votes over his nearest opponent.

At the recent annual meeting of the House of Delegates of the American Medical Association, it was decided to apportion one delegate for each 950 members or fraction thereof. On this basis our State Association is entitled to three delegates at the 1925 meeting.

Dr. and Mrs. Einer W. Johnson, of Bemidji, with their two children, will sail September 4 from Quebec on the Montlaurier for Europe, where they will spend a year. Dr. Johnson plans to engage in the further study of medicine in Edinburgh, London, Vienna and Copenhagen.

Announcement has been made of the engagement of Miss Dorothy Trapp, daughter of Mr. and Mrs. T. J. Trapp, of New Westminster, British Columbia, to Dr. Roger S. Countryman, of St. Paul. The wedding will take place at the home of the bride's parents, Wednesday, September 3.

Notice has been received of the death of Dr. Timothy Geraghty, noted surgeon and authority on urology, which occurred Sunday, August 17, at the Johns Hopkins hospital at Baltimore. Dr. Geraghty was but forty-eight years old. In collaboration with Dr. Rountree, of Rochester, he originated a method for determining functions of the kidneys which now is used throughout the world. For the past ten years, Dr. Geraghty was associate professor of urology in the James Buchanan Brady Urological Institute at Johns Hopkins hospital.

A meeting of the State Board of Health was held at the Capitol in St. Paul August 19th, to which were invited many institution executives for the discussion of the advisability of adopting new regulations for the control of infection both to and from hospitals and similar institutions. As a result of a questionnaire sent out recently by the Board of Health, it became evident that many hospitals have had difficulties in the control of infectious disease among patients, nurses and employees.

It was brought out that there is no state law requiring a hospital to maintain an isolation wing or room. Minneapolis has such an ordinance. Also there is no state law compelling vaccination of school children unless an epidemic exists. The advisability of a law requiring the vaccination of employees in institutions caring for the sick was discussed.

As a result of the meeting Dr. Scofield, president of the State Board of Health, has appointed a committee to draw up regulations to be submitted to the Board of Health and Board of Control for adoption.

The Chicago Eye, Ear, Nose and Throat Postgraduate School announces the following courses:

1. A three months' graded course beginning October 1, January 1, April 1 and July 1, to qualified physicians.
2. A twelve months' graded course beginning January 1, 1925, and every January first thereafter. A three months' course must be taken before entering a twelve months' course.
3. A nine months' course as clinical assistant with salary of \$50.00 a month to those who have had the two above courses, thus completing a two years' course.
4. A clinical course to general practitioners of any duration beginning any time.
5. An operative eye course of one week beginning November 3d.
6. An operative ear, nose and throat course of one week beginning November 10, 1924.

Details may be obtained by applying to the Chicago Eye, Ear, Nose and Throat College, 235 West Washington Street, Chicago, Illinois.

ADVANCES IN THE UNIVERSITY

Reorganization of the department of pediatrics under Dr. Frederic Schlutz has been an outstanding development of the year in the Medical School. Dr. Schlutz comes to the University as a full-time professor, thus settling the status of this department, which had been a matter of some controversy. This arrangement looks forward in part to the time when the Medical School will have the Minnesota Hospital and Home for Crippled Children as a part of its plant, when the gifts of William Henry Eustis shall have been received in full. Results of the interest other donors have taken in the Medical School have come to fruition during the year in the beginning of construction on two hospital additions. These are the Todd Memorial Hospital, for eye, ear, nose, and throat cases, and the George Chase Christian Memorial Cancer Hospital. Both will be connecting units of the Elliott Memorial Hospital. They will be completed about a year hence. Due to this enlargement, Dr. L. B. Baldwin, superintendent of the hospitals, has been put on a full-time basis.

Much more than can be given here must be told of the year's additions to the physical plant of the University of Minnesota and of the development of plans for beautifying the campus. Most of these accomplishments have been the result of plans laid long ago, but just now matured. Among these has been the final removal of the Northern Pacific Railway tracks, leaving quiet and a considerable tract of property where formerly a gully, noisy with the rattle and roar of trains, had to be endured. The athletic Stadium, made possible by the gifts of many thousand loyal friends of the University, is approaching completion. It will be

used for the entire football schedule of the present autumn. The new University of Minnesota library, under construction for two years, is in shape to serve the student this fall, and work has been begun on the Administration Building, a unit in the original Comprehensive Building Program, for which the 1919 legislature voted funds. Other additions to plant that the year has seen placed in service have been the splendid new Experiment Station of the School of Mines, the new Electrical Engineering Building, and a Storehouse and Shops building that houses the many departments for self-service by which the institution is able to make a wholesome saving. Thanks to the care and study bestowed on plans for the Electrical Engineering building by members of the department and by architects, it is said to be the most effective laboratory yet erected for the purpose of collegiate instruction in that swiftly growing field.—Minnesota Chats, Vol. 3, No. 47.

IMPROPER SOLICITATION

Physicians throughout the state and possibly throughout the country recently received two lead pencils from an organization called the National Disabled Soldiers League, New York, with a strong appeal for a contribution of one dollar for the help of the disabled soldiers. The remark in the letter that it was the hope of the writer that no physician would be so mean as to keep the pencils and not contribute the dollar was a clever method of obtaining the desired results in many instances.

A clipping from the Disabled American Veterans Weekly dated Washington, August 15, and issued by General Hines, states in part: "You are advised that this organization does not have any standing before this bureau, and is not recognized in a co-operative relationship as are the American Red Cross, the American Legion, the Disabled American Veterans of the World War, etc. The Bureau would prefer not to comment on the form of solicitation concerning which inquiry is made, as it is at present the subject of investigation."

Further information has been given out by Adjutant Stafford King of the American Legion, Department of Minnesota, to the effect that "So far as I am able to ascertain, the National Disabled Soldiers League is organized for the purpose of securing moneys, and according to my information has no other purpose. It may be legally constituted or not, but in any event the time has not yet arrived in the United States of America when it is necessary to solicit funds for the actually disabled man by any such manner of solicitation. I would suggest that you take the necessary steps to inform your medical associates that this league deserves no constructive assistance."

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

MANHATTAN EYE SALVE COMPANY:

Butyn Ointment-M. E. S. Co.

Holocaine Ointment-M. E. S. Co.

Benzyl fumarate-Abbott. Benzylis fumaras.—It contains not less than 99 per cent of benzyl fumarate. Benzyl fumarate acts like benzyl benzoate and benzyl succinate in lowering the tone of unstriped muscle. Like benzyl succi-

nate, it has the advantage over benzyl benzoate in that, because of its insolubility in water, it is practically tasteless and does not produce gastric disturbance. It is employed in the same conditions as benzyl benzoate and benzyl succinate (see New and Non-official Remedies, 1924, p. 69 and 71). The Abbott Laboratories, Chicago.

Sulpharsphenamine-Metz.—A brand of sulpharsphenamine-N. N. R. For a discussion of the actions, uses and dosage of sulpharsphenamine, see New and Non-official Remedies, 1924, p. 56. Sulpharsphenamine-Metz is supplied in ampules containing, respectively, 0.05, 0.075, 0.1, 0.15, 0.3, 0.45 and 0.6 gm. The H. A. Metz Laboratories, New York (Jour. A. M. A., July 5, 1924, p. 41).

Mead's Cod Liver Oil.—It has a vitamin potency so that one-fourth of one per cent cures experimental rickets in rats in five days when added to the diet. For a discussion of the actions and uses of cod liver oil, see Useful Drugs, 6th edition. Mead Johnson and Co., Evansville, Ind. (Jour. A. M. A., July 12, 1924, p. 121).

Oleo-Bi (Roche).—A suspension of finely divided bismuth oleate in olive oil, containing bismuth oleate equivalent to 0.05 gm. of bismuth (Bi) in each c.c. Oleo-Bi (Roche) is proposed as a means of obtaining the systemic effects of bismuth in the treatment of syphilis (see Bismuth Compounds, New and Non-official Remedies, 1924, p. 74). Two c.c. are administered intramuscularly, preferably into the gluteal muscle, two or three times a week. Oleo-Bi (Roche) is marketed in the form of 2 c.c. ampules. The Hoffmann-LaRoche Chemical Works, New York (Jour. A. M. A., July 19, 1924, p. 195).

Butyn Ointment-M. E. S. Co.—Composed of butyn (see New and Non-official Remedies, 1924, p. 32) 1 per cent, water 1 per cent, wool fat and petrolatum 98 per cent. The ointment is put up in collapsible tubes for application to the eye. Manhattan Eye Salve Co., Louisville, Ky. (Jour. A. M. A., July 26, 1924, p. 271).

PROPAGANDA FOR REFORM

Purifico, a Cancer Cure Fraud.—In 1917 the persons doing business as the Purifico Company pleaded guilty to the charge of the federal authorities that the claim that Purifico was an effective remedy for cancer and other conditions was false and fraudulent. Now a fraud order has been issued against the Purifico Company denying the firm the use of the mails. Analysis showed "Purifico No. 1" to be a watery, alcoholic, sugar mixture of cinchona, plant extractives, a vegetable laxative and potassium iodid. "Purifico No. 2" was a watery, alcoholic mixture of cinchona, plant extractives and potassium iodid. "Purifico No. 3" was a watery, alcoholic, sugar mixture of plant extractives, including valerian (Jour. A. M. A., July 5, 1924, p. 56).

"Cuprase—Chemical Colloidal Copper."—In 1919 the Council on Pharmacy and Chemistry reported on Cuprase, marketed by the Anglo-French Drug Co. It stated that the claims made for this preparation are those commonly made for "cancer 'cures,'" and held that these could not be too strongly condemned. The Council contrasted the loose statement of the Cuprase advertising with the results reported by Richard Weil, who was unable to find that colloidal copper had any therapeutic value. The Council declared the claims made for Cuprase extravagant and cruelly misleading (Jour. A. M. A., July 5, 1924, p. 59).

More Misbranded Nostrums.—The following products

have been the subject of prosecution by the federal authorities charged with the enforcement of the Food and Drugs Act: Smith's Buchu Lithia Pills (C. F. Smith), containing powdered licorice, extracts of plant drugs including uva ursi and podophyllum, sodium, potassium, lithium and magnesium compounds, including nitrate and citrate, and soap. Famous Mineral Well Water (Famous Mineral Wells Water Co.), adulterated water, consisting in whole or in part of filthy and decomposed animal or vegetable substances. Foley's Kidney Pills (Foley and Co.), containing potassium nitrate, methylene blue, hexamethylanamin tetramin and plant material including resin and juniper oil. Ironglad Tonic Tablets (Sanitary Products Co.), containing an iron compound and material of animal origin. Remlock 300 (Remlock Hills Laboratory), consisting of 99 per cent water and 1 per cent calcium hypochlorite, calcium chlorid and calcium carbonate. Trask's Ointment (D. Ransom, Son and Co.), consisting of extracts of plants, including tobacco and lobelia, mixed with fat. Tubbs White Pine Cough Cure (The Tubbs Medicine Co.), consisting essentially of pine tar, extract of a bark, chloroform, sugar, alcohol and water (Jour. A. M. A., July 12, 1924, p. 138).

PROGRESS

Abstracts to be submitted to Section Supervisors.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH
THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

INDIVIDUAL CONSTITUTION VS. ENDOCRINE GLANDS: Julius Bauer (Buffalo General Hospital Bulletin, Oct., 1923). Those who did not have the opportunity of hearing Dr. Bauer during his visit to the Northwest, have the opportunity of reading his paper in the above noted periodical.

The author first remarks about the tendency to overestimate the important branches of science in the beginning of their development, also the attempts to clear up certain unexplained facts by means of the newly developing science, taking mere hypotheses for established facts.

Eunuchoid gigantism and eunuchoid obesity are two different types of abnormal development, which may be manifestations in primary hypogenitalism. Some other factors must determine the result and the general assumption is that the hypophysis and other ductless glands are the determining factors. If this is the case, how may borderline cases be explained?

The power of growth is a constitutional characteristic, transmissible by inheritance and must be localized in the germ cells. There may be present a high, moderate or a slight constitutional growth-power and as well, varying grades of glandular sufficiency.

The analogy between certain racial and individual peculiarities and the constitutional factor is made. The endocrines do not produce, but rather influence, augmenting or checking the chromosomal potency and not one but the total of all the endocrines combined with the constitutional

chromosomal reactivity of every body cell, determines the consequences of an endocrine trouble and the varied clinical symptomatology.

In conclusion the writer mentions experimental therapy with extracts of fetal organs, which have been seemingly satisfying.

T. A. PEPPARD.

THE MODERN TREATMENT OF TUBERCULOSIS OF BONES AND JOINTS: G. R. Girdlestone (*Tubercle* [London] 1924, v, 32). Twenty years ago tuberculous disease attacking the spine or hip only too commonly meant persistent pain, increasing deformity, sinuses profusely discharging, long months of suffering, lardaceous disease and death. Nowadays there is little excuse for delay in diagnosis or prompt admission to a special hospital. If admitted in good time the patient quickly loses all his pain, ceases to go down hill and starts the slow process of recovery. Although there has been a period of rapid progress, complete uniformity of method has not been secured. The leading special hospitals reflect the ardor of their genius loci whether he worship the sun or the Thomas tradition.

A bone focus is a proof of established tuberculous infection, but it is even more, for the new focus is tangible evidence that the invasion of the body is advancing. Now the enemy has had a great success and has got a new hold. Things are going wrong. It is, however, a fight in which we can join, and treatment has now become so effective that we can insure complete victory for our patient in almost every case. Relapsed cases are the result of lack of sufficient follow-up of discharged patients and disinclination on the part of those responsible to furnish funds for adequate treatment. A cure in our hospital register may be a very sick patient in another hospital's bed.

The aims of the treatment are general and local.

1. First to raise the patient's general vitality as quickly and as fully as possible.
2. Ultimately to restore the full health of the patient, who should be free from any signs of tuberculosis, focal or general, with his powers of resistance to the tubercle bacillus so raised as to enable him to repel any further attack.
3. The prompt elimination of any factor, such as strain or movement, harmful to the diseased part, and the application, so far as possible, of rest, comfort, warmth and stimulus to local circulation.
4. The avoidance of septic infection.
5. The restoration of the strength and function of the affected part.

These points are usually best achieved by prompt admission of the patient to an open-air Orthopedic Hospital. The virtues of sunlight and moving air should not induce us to relinquish the accuracy of our splintage. Operations may be helpful, or even essential to cure, but to consider them as short-cuts is a sin which will be visited on our patients. Rest and time remain the essential ingredients of our prescription.

Food must be adequate but not excessive.

As regards the action of the sun and the wind in tuberculosis, it is most unfair to both to consider them apart.

We want every bit of help we can get for our patients and we now know how to get help from the sun; but I am

not yet convinced that the advantage of pigment is other than protective.

The first step in heliotherapy is the carefully graduated exposure of the body in order to develop pigment; and until and unless pigment is developed, only a small dose can be tolerated, and more than a small dose is definitely harmful.

While the sun warms steadily, the wind cools variably. The sun saves the patient from undue cold, the wind from undue heat. The combination is pleasurable, and like a contrast bath it promotes an active hyperemia in the skin. The wind is itself a great stimulus to metabolism.

Wind and sun are heaven-sent partners, neither can be used to the best without the other. Together they work in ways far beyond direct heliotherapy as a source of health and vigor, they stimulate and cheer us all and particularly patients in open-air wards. Possibly, too, the partnership between sun and air may be more intimate than we know fully yet. One virtue of open-air wards may lie in the effect on our patients of breathing air which is often sunny as well as always fresh.

The splintage should:

- (1) Hold the parts accurately and comfortably in whatever position is chosen.
- (2) Not constrict the circulation in the affected part.
- (3) Not interfere with respiratory movements.
- (4) Allow exposure of the affected part to sun and air and as much exposure of the rest of the body as possible.
- (5) In spinal caries, we should allow full exposure of the back whenever necessary without risk of local strain or movement, and where bone destruction has made a local kyphosis inevitable and desirable for the sake of sound healing and stability, it should be minimized and localized and compensatory curves should be developed.

To open and drain a cold abscess is to commit a surgical crime. Dr. Rollier put the matter thus—he labeled such a proceeding “catastrophic,” and said it was “almost a condemnation to death, not at once, but in two or three years,” and added, “we cannot struggle too much against it.”

In conclusion. A tuberculous focus in a bone or a joint is the obvious part of a deep-rooted disease, serious in itself, crippling if there is delay, disastrous if there is neglect; but it is also evidence of tuberculous infection of the body which pre-existed but is now gaining the upper hand. On the other hand, modern treatment with its artistic use of rest, food and weather, if started in good time and kept up long enough, will almost always bring about a cure.

ARTHUR T. LAIRD.

THE RELATION OF BLOOD PRESSURE TO THE AMOUNT OF RENAL TISSUE: Hilding C. Anderson (*Jour. of Exp. Med.*, May 1, 1924). Dr. Anderson presents his experimental work on rabbits, in which he produces renal insufficiency by removing or destroying approximately 70% of kidney parenchyma.

Estimation of urea-nitrogen and creatinine and blood pressure readings were made. The kidneys were examined in those rabbits which died. The feeding of the rabbits was taken into consideration.

These experiments indicate that a marked reduction of kidney substance in rabbits does not result in hypertension, even where prolonged insufficiency results.

T. A. PEPPARD.

SURGERY

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THE ETIOLOGY AND TREATMENT OF NON-TUBERCULOUS PULMONARY ABSCESS: W. Whittemore (Surg., Gyn. and Ob., April, 1924). Most cases of non-tuberculous pulmonary abscess follow the administration of general anesthesia in operations on the upper respiratory tract, in which material of some kind is aspirated into the lung. Pneumonia comes next in frequency and septic infarction next. There are many other less frequent causes.

The treatment in these cases consists of the following:

1. Expectant.
2. Artificial pneumothorax.
3. Bronchoscopy.
4. Operation.

Expectant treatment means general measures and gravity drainage by postural means two or three times a day. The number of cures effected by expectant treatment varies from 7 per cent to 51 per cent. This treatment can be safely continued so long as the patient improves, but surgery should be considered if improvement ceases or if the patient's general condition becomes worse.

Artificial pneumothorax may be employed in conjunction with postural drainage and should be continued over a period of from three months to a year. The presence of strong adhesions contraindicates and makes this treatment of little avail. Artificial pneumothorax is very valuable in determining whether or not adhesions are present and where. The dangers attending artificial pneumothorax are air embolism and rupture of an abscess with resultant empyema.

Aspiration through a bronchoscope in the hands of a specialist in early cases is sometimes successful, especially if a foreign body which was the primary cause of the condition is removed. Suggestion is made of this method of treatment in surgical cases which do not do well after operation.

In general, if there is a large amount of foul sputum, marked general sepsis and the abscesses are situated in the periphery of the lung with a demonstrable fluid level by x-ray, operation is indicated and is usually attended by favorable results. In cases in which no improvement occurs in 4 or 5 weeks, or if the general condition becomes worse, operation is indicated. The operative procedures in cases in which adhesions are present should all be done under local anesthesia and consist of opening into the abscess with the finger and instituting drainage with a very soft rubber tube. In cases in which there are no adhesions, the pleural cavity is explored to locate the abscess by palpation and the area is fixed to the chest wall with sutures, leaving a gauze pad over the abscess itself. This is done under some form of differential pressure anesthesia. The one preferred by the author is gas and oxygen through a

snug mask. In five days the wound can be reopened and the abscess opened as described.

Acute abscesses should be drained four or five weeks or longer and the chronic cases may have to be drained from three to six or more months.

From 60 to 70 per cent of the cases operated on can be permanently improved or cured. Five per cent die from hemorrhage after a few months.

W. P. HERBST.

SURGERY OF THE THORAX: D. B. Phemister (Surg., Gyn. and Ob., April, 1924). The factors that bring about expansion of a collapsed lung in acute empyema with drainage, where stabilization of the mediastinum has occurred are:

1. The pull of the contracting granulations on the visceral pleura at its reflection onto the parietal pleura as the two layers fuse, and the cavity is gradually obliterated.
2. The positive pressure within the collapsed lung produced by the entrance of air from the opposite side during forced expiration.
3. The negative pressure in the empyema cavity present during inspiration, when the diameter of the drainage opening is smaller than that of the main bronchus on the affected side.

The first factor is the most important. The creation of the most favorable conditions for wound healing should receive first consideration in treating this condition. Simple drainage is essential and the tube cannot be left in too long. Fibrin in the pleura is objectionable only in that it is partly replaced by granulations which thicken the pleura. Irrigation in acute empyema is only indicated when there are sloughs and where there is a large amount of fibrin.

W. P. HERBST.

PEDIATRICS

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X-RAY TREATMENT OF PERTUSSIS: R. R. Struthers (Canadian Medical Association Journal, February, 1924), (Arch. of Ped., May, 1924). Struthers reports a series of 45 cases treated in Montreal in three months. The first cases were treated by short exposures every other day for two or three treatments; most cases were treated by a large single exposure. Of the 48 cases, 7 showed prompt cure, the whooping and vomiting ceasing usually within 24 hours and not returning. Twenty cases or 45 per cent were relieved, showing amelioration of symptoms, within four or five days. Eighteen cases or 40 per cent were not improved appreciably. Conclusions are: 1. The larger the dose of the ray the greater the apparent improvement; all the prompt cures except one received the larger dose. 2. The earlier in the paroxysmal stage the treatment is given the greater is the probability of relief.

R. N. ANDREWS.

CAUSES AND TREATMENT OF OTITIS MEDIA, OBSERVATIONS ON TWO HUNDRED AND THIRTEEN CONSECUTIVE HOSPITAL ADMISSIONS: David T. Smith (*Amer. Jour. of Dis. of Child.*, July, 1924). In 613 admissions, 33.4 per cent of the children either had otitis media when they came in or developed it while in the hospital. The race and sex of the patient seemed to have no relation to the incidence of the disease. There was a definite seasonal variation. In February, 47.3 per cent of the patients had otitis media; in July only 23.6 per cent of the children were attacked. The most susceptible period was between the ages of 3 and 15 months. In this group more than 50 per cent of the children had otitis media. Patients with pneumonia, dysentery, nasal diphtheria, pertussis and pyelitis developed otitis media in 50 per cent or more of the cases. Those with the condition of prematurity, nephritis and the noninfectious diseases showed ear infections in less than 21 per cent. Hemolytic streptococci were isolated from the aural discharge in 56 per cent of the fifty cases cultured.

Practically all the gram-negative bacteria found in the ears of patients suffering from otitis media, except pyocyanus bacilli, are killed by an 0.5 per cent solution of sodium hydroxy-mercuri-benzophenone sulphonate. One of the difficulties with the ordinary method of treatment is the fact that only the external canal is treated; the organisms in the middle ear are not reached. After trying a number of solutions it was found that ordinary commercial hydrogen peroxid diluted one-half with water was the most efficient irrigating fluid. An ordinary medicine dropper with a good stout rubber bulb is the most useful and practical instrument to use. The peroxid liquefies the pus and at the same time serves as an indicator of the presence of more pus. So the mothers and nurses were instructed to irrigate the ears until the peroxid no longer frothed. After the irrigation, the excess of fluid in the external canal was removed by swabbing with a little cotton. After this the antiseptic penetrates into the middle ear and attacks directly the organisms responsible for the discharge. Not a single case of mastoiditis developed in a series of seventy-five acute and chronic cases which were irrigated with this solution.

Pyocyanus bacilli are readily eliminated by treatment with 2 per cent acetic acid, or preferably with 0.5 per cent of the sodium solution which contains 2 per cent acetic acid. It was found that acetic acid could be combined with the sodium solution. Enough glacial acetic acid was added to the 0.5 per cent sodium solution to make a 2 per cent solution of acetic acid. This solution was just as efficient in killing bacteria of the colon group as the sodium solution alone, and it killed pyocyanus in higher dilutions than acetic acid.

All the gram-positive bacteria found in otitis media are readily killed by gentian violet except streptococci. Neutral acriflavine has been proved more potent in the treatment of otitis media associated with streptococci, but even this drug is not entirely satisfactory. Twenty cases of chronic otitis media were cured by local chemotherapy in an average of seven days each. Sixty cases of acute otitis media were cured in an average of thirteen days each.

R. N. ANDREWS.

THE CLINICAL VALUE OF THE ROUTINE EXAMINATION OF BLOOD SMEARS IN THE DIAGNOSIS OF PERTUSSIS: A REPORT OF 300 CASES: Henry Heiman (*Arch. of Ped.*, June, 1924). Thus far but little has been accomplished in diminishing the incidence or severity of whooping cough. Pertussis vaccines have proven to be of little value either in the prevention or cure of the disease. The intracutaneous reactions for testing immunity have not been successful. One of the chief obstacles at present in preventing the spread of whooping cough is the difficulty of early diagnosis. From this viewpoint, the author presents the results of the examination of blood smears in 300 cases of pertussis and pertussis suspects from private practice, observed during the past five years.

Frohlich found a constant leucocytosis and lymphocytosis but concluded that the blood examinations were of no great value because the changes did not appear early enough in the disease. Churchill, from blood examinations of 35 patients, concluded that there was a lymphocytosis in 85 per cent of the cases. Ashby studied 100 cases of whooping cough and says: "Thus if a child who has been known to have been exposed to the infection of whooping cough starts with a cough, a blood examination will very likely show whether it is going to be whooping cough and then isolation can be undertaken early."

In the author's study of 300 cases of whooping cough and whooping cough suspects, his aim was to perform the simplest, most rapid blood examination in order to make it a more general routine procedure in private practice. He based his test only on a relative lymphocytosis. No total white blood counts were done to determine the leucocytosis present. A blood smear was taken in each case and stained with Jenner's dye. One hundred white cells were counted and for practical purposes a simple division, including only polynuclear cells and lymphocytes, was made. The eosinophilic leucocytes were included in the polynuclear and the transitional cells in the lymphocyte counts. Small and large lymphocytes were grouped together. The entire procedure takes but a very few minutes and can be performed in the course of routine office examinations on all suspicious cases. The common "cold," nasopharyngitis, bronchitis and laryngitis do not show this lymphocytosis.

The results of the examination of blood smears in 300 cases of pertussis have been presented, not to demonstrate any new and positive method for diagnosis, but to emphasize the almost constant occurrence of lymphocytosis as a very useful aid in the early detection of this serious infection of childhood. The procedure is simple and rapid and may be employed in the routine examination of all suspicious cases.

R. N. ANDREWS.

MENINGEAL HEMORRHAGES IN THE NEW-BORN AND THEIR REMOTE CONSEQUENCES: Alfred Gordon (*Am. Jour. of Dis. of Child.*, April, 1924). The cause of meningeal hemorrhages is, principally, the tearing of the membranes due to their overstretching, which leads to rupture of the blood vessels. To produce a tear, there must be cranial stress. Since the latter is frequently the result of protracted, difficult labor, with instrumental delivery, the obstetrician should bear in mind that the force used in the application of forceps should not be excessive,

or should not be applied to the wrong diameter of the head, as, for example, the anteroposterior diameter. Forceps are useful, and in many instances have been responsible for saving lives, but they may also be responsible for injuries in the fetus leading to consequences which have a direct bearing on the later physical and mental development of the child.

The preventive aspect lies in the consideration of all forces that are liable to lead to tearing of the meninges and the blood vessels. Wrong presentation and position of the fetus and other causes of difficult labor, such as prolapse of umbilical cord, the use of instruments or various manipulations in the delivery of the fetus, are all factors that cannot be overestimated in the production of cerebral hemorrhages and the tearing of the meninges.

Besides the preventive phase, consider briefly the therapeutic aspect of meningeal hemorrhage. With a certain degree of possible errors, supratentorial hemorrhages, generally speaking, present a somewhat different clinical picture from the infratentorial type. In the former, the blood spreads over the hemispheres of the cerebrum; in the latter, over the hemispheres of the cerebellum but also into the medulla. In the former, the blood cannot go beyond the lower surface of the tentorium; in the latter, the blood reaches the subarachnoid space and may extend into the spinal canal.

For these reasons, in the supratentorial hemorrhage at birth, one finds a bulging fontanel and a group of nervous phenomena, such as sleeplessness and great restlessness and convulsive seizures. In infratentorial hemorrhage, there is considerable depression, apathy, somnolence, early cyanosis, vasomotor and respiratory manifestations and rigidity of the neck muscles. In view of the anatomic differences, respiratory and other bulbar disturbances will not be observed in the cases of supratentorial hemorrhage.

Cyanosis is late in appearing and, when it does appear, is not pronounced in the supratentorial hemorrhages, but is early and very pronounced in the infratentorial cases; the anterior fontanel is at once bulging and early in appearance in the supratentorial, but slowly distending in the infratentorial cases. For anatomic reasons, in infratentorial cases lumbar puncture may be of considerable benefit. In the supratentorial cases lumbar puncture does not avail much, as the blood cannot reach the subarachnoid cavity easily.

Cushing, who obtained four complete recoveries in nine cases, is of the opinion that no hesitation should exist in operating on such young infants, in view of the fact that the new-born can withstand cranial operations better than any other operation and that much less traumatism is created by an operation than by the passage of the head through the pelvis during birth.

R. N. ANDREWS.

HEMORRHAGE OF THE NEW-BORN: Floyd Clarke (Arch. of Ped., May, 1924). Schloss and Commiskey have classified hemorrhage in the first few days of life as follows:

- (1) Traumatic—from obstetrical or surgical procedure.
- (2) Accidental—illustrated by insecure tying of the cord.
- (3) Spontaneous—without apparent cause.

Frequency:

Warwick, in a series of autopsies on new-born infants, found cerebral hemorrhage in 50 per cent of one series, and 42 per cent in another. She also found hemorrhagic disease of the new-born accompanying cerebral hemorrhage in 20 per cent of her series. In the Boston Lying-In Hospital, cerebral hemorrhage occurred once in every 300 deliveries.

Cause:

Trauma, due to a faulty application of forceps, or to some complication of a difficult labor, is well recognized. Another factor is intrauterine asphyxia, thereby raising the fetal blood pressure. There exists also a definite disease, viz., hemorrhagic disease of the new-born. In this peculiar disease, limited to the first few days of infancy, there occurs a deficiency of prothrombin, in the blood, and a prolonged coagulation and bleeding time.

Diagnosis:

These infants have a peculiar sharp cry, the fontanel is frequently bulging, they are spastic, disinclined to nurse, and occasionally have convulsions. In hemorrhagic disease of the new-born, the blood is usually apparent, the baby exsanguinated and in shock.

Prophylaxis:

The author believes that the mortality from hemorrhagic disease of the new-born would be less if every new-born babe were given a routine test as to his blood coagulation and bleeding time.

Treatment:

Repeated lumbar punctures may be done to help in decreasing the intracranial tension. Depending on the location of the hemorrhage and its extent, surgical procedure should be resorted to. In hemorrhagic disease of the new-born, the injection of whole blood is curative. Thirty c.c. of blood should be injected at one time and repeated as evidenced by coagulation and bleeding time tests, or by the appearance of blood. Rodda asserts that if the injection of blood from one donor is not curative, a second donor's blood should be used. It can be injected intramuscularly, intravenously or intraperitoneally with complete success.

About a year ago Dr. G. F. Still of London made the statement to a number of us that he considered gelatin given by mouth as valuable in the treatment of hemorrhagic disease of the new-born as the injection of blood. His opinion is of value.

R. N. ANDREWS.

ROENTGENOLOGY

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THE ROENTGENOLOGIC DIAGNOSIS OF DIA-PHRAGMATIC HERNIA WITH A REPORT OF SEVENTEEN CASES: Carman and Fineman (Radiology, v. 3, p. 26, July, 1924). Seventeen cases are reported in considerable detail.

The following conclusions are derived from this study:

1. Ordinarily diaphragmatic hernia may be easily demonstrated on roentgenologic examination but failure occasionally occurs on the first examination. This may be explained on the basis of the following factors: (a) that it develops as a sequel to paradiaphragmatic purulent processes, trauma, or lacerations; (b) that spontaneous temporary reductions may occur; (c) that only one of a double hernia may be demonstrated; (d) the opaque medium may not pass through the opening due to strangulation or position; (e) solid viscera may be the only contents of the sac so the administration of opaque media will not reveal it.

2. Hernia of the kidney may be demonstrated by pyelography.

3. Diaphragmatic hernia must be distinguished from mechanical elevation and true eventration of the diaphragm, hour-glass stomach, and esophageal diverticula.

4. It is important to determine the length of the oesophagus to rule out the cases of congenital short oesophagus which are inoperable.

5. Chest symptoms often lead to roentgenologic studies but frequently the condition is mistaken for other chest diseases before the use of the opaque medium.

6. An attempt should be made to ascertain the exact site of the hernial opening in order to direct the surgical approach.

Numerous illustrations are given, particularly to demonstrate the roentgenologic appearance of the chest in diaphragmatic hernia, without the use of the opaque medium, and to compare it with other chest conditions.

The bibliography is of great value.

LEO G. RIGLER.

SOME CONSIDERATIONS IN THE TREATMENT OF CARCINOMA OF THE ESOPHAGUS: Quick (Am. Jour. Roent. and Radium Therapy, May, 1924). Carcinoma of the esophagus up to the present time is fatal in practically 100% of the cases. This may be partially due to failure to recognize the disease in its early stages, and partially to the resistant character of the tumor and its inaccessibility. Dysphagia is one of the earliest symptoms. Frequently growths are overlooked in the roentgen examination and early esophagoscopy is urged.

The treatment is only palliative. Torek's successful surgical removal is the only one on record. Lilienthal's direct exposure by surgery may aid in the treatment by permitting direct radiation to the tumor.

The author has observed 196 cases in the past seven years. The first of these were treated by direct application of small doses of radium through the esophagoscope, which are very effective in controlling ulceration and hemorrhage. The growth of the tumor is not affected. Intraesophageal application of larger doses causes swelling and obstruction. External uses of massive doses by means of the radium pack is impractical. The best method is high voltage roentgen ray, which in his experience adds years to the patient's life. Direct application of small doses of radium is used in combination.

Quick advocates very emphatically external gastrostomy at the very onset of symptoms. Gastrostomy late in the disease is usually fatal. He believes it should be done at once even if obstruction is minimal, as it is imperative to keep up the patient's nutrition. In their last cases the combination of early gastrostomy and high voltage roentgen therapy has resulted very favorably.

LEO G. RIGLER, M.D.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS PHYSICIANS LICENSED AT THE JUNE (1924) EXAMINATION TO PRACTICE IN MINNESOTA BY EXAMINATION

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Lancaster, Wilson McArthur..	Western Med., London, Ont., 1909	Wahpeton, N. D.
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BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

MANUAL OF DISEASES OF THE EYE. Charles H. May, M.D., Director and Visiting Surgeon, Bellevue Hospital, N. Y., etc. Eleventh edition, revised. 374 illus. including 23 plates, with 73 colored figures. Cloth, \$4.00. New York: William Wood and Company, 1924.

GOITER: NONSURGICAL TYPES AND TREATMENT. Israel Bram, M.D., Instructor in Clinical Medicine, Jefferson Medical College, Philadelphia. New York: The MacMillan Company, 1924.

CIRCULATION IN HEALTH AND DISEASE. Carl J. Wiggers, M.D., Professor of Physiology in the School of Medicine, Western Reserve University, Cleveland, Ohio. 641 pp. Second edition, 1923. Cloth, \$7.50. Philadelphia and New York: Lea and Febiger.

This very comprehensive and scholarly book deals with the physiology and pathological physiology of the heart and circulation.

The first portion of this work deals with the normal physiology of circulation. The properties of the heart, cause of the heart beat, nervous enervation, sequence of events, and blood pressure are gone into in a most searching and thorough analysis. Physiology of the pulmonary and peripheral circulation complete the first section.

"Graphic Methods for the Clinician" are considered next. These include the sphygmograph, phlelogram, electrocardiogram and the interesting but not so well known photokymograph. The questions of venous and capillary pressure are also included here. Apparatus, technic and clinical interpretation are very explicitly handled.

The last section, "Diseases of Heart and Circulation," applies the foregoing in a thorough review of symptomatology and diagnosis. The classification of abnormal cardiac rhythms is simple, clear cut and seems to us to be the most understandable of the classifications of this disorder.

Many graphs make even more attractive this extremely worth-while book.

BURTON ROSENHOLTZ, M.D.

PHYSIOTHERAPY TECHNIC: A Manual of Applied Physics. C. M. Sampson, M.D., formerly of the Physiotherapy Service, Walter Reed U. S. Army General Hospital, Washington, D. C., etc. 443 pages. 85 illustrations. Cloth, \$6.50. St. Louis: C. V. Mosby Co., 1923.

In reviewing this book one is impressed by the author's sincere enthusiasm for this comparatively young field of therapeutic medicine. His experience has been extensive, his results as claimed in his book and lectures most astonishing. The book contains many helpful suggestions and is indeed instructive; however, one must not lose sight of the fact that there are still other therapeutic agents equally important.

The chapters dealing with high frequency and diathermy give one a good working foundation for this special therapeutic agent. A thorough description of the apparatus and its application is discussed in a manner that is easily understood. In our experience converse heat (diathermy) has a distinct place in therapeutic medicine. It is of great value in the after-treatment of fractures and sprains and wherever heat is indicated. It has a great advantage over other types of heat in that it will heat most distant parts. The author gives in detail a description of stimulative and sedative diathermy technic. Knowledge of the agent one is using is of primal importance to accomplish the best results.

Ultra violet light is a second great agent described in this book. It is very important and has a very definite place in medicine. More space in this chapter might well have been devoted to case illustrations, and the application of ultra violet ray in some of the more common diseases. The chapters on hydrotherapy and massage are important although somewhat abbreviated. The use of the various electrical modalities such as static, faradic and galvanic currents are described in some detail.

The book serves a definite purpose in that it brings before our profession the importance of physiotherapy and its agents. It emphasizes the fact that to accomplish results one must be familiar with the apparatus, its proper application and its limitation. It does give one a better knowledge of the material one is using.

A. E. FLAGSTAD, M.D.

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ORIGINAL ARTICLES

NASAL DEFORMITIES*

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I am reporting six cases to illustrate the method of treatment of certain types of nasal deformities, including saddle-back deformities, humps, angiomas, the use of full thickness skin grafts, and the reconstruction of part of the lower third of the nose.



Fig. 1 (Case A455091). Saddle-back nasal deformity.

CASE 1 (A455901). *Saddle-back deformity.*—The patient came to the Clinic February 9, 1924, for the correction of a nasal deformity following an accident ten years before. He had had no treatment or operation since then (Fig. 1). A lead pattern was made of the size of the cartilage that would be necessary to fill the deformity. Under block and local anesthesia, a piece of cartilage from the eighth rib was removed. Then an incision was made in the columella below the tip of the nose, and by means of small, curved, blunt-tipped scissors a pocket was made over the bridge of the nose, care being taken to stay close to the nasal bones. The piece of rib cartilage, after being shaped to the correct

size, and the perichondrium being removed, was inserted to elevate the deformity, and the incision closed with dermal sutures. Figure 2 shows the patient after operation.

Comment.—Saddle-back nasal deformities are best treated by the insertion of rib cartilage, which can readily be taken from the seventh or eighth rib, under local anesthesia. It may be inserted either through an incision across the bridge of the nose, or one just below the tip in the columella. The latter incision is less noticeable, and the results in this group of cases are very satisfactory.

CASE 2 (A454026). *Nasal hump.*—Ten years before examination at the Clinic, the patient had bumped the bridge of the nose, and the nose had always been a little larger at this point. Ten months before, a similar accident occurred and after this, an enlargement of this part of the nose was noticed. Examination January 29, 1924, revealed a bony thickening over the lower end of both nasal bones. The thickening was quite hard, but did not feel like a neoplasm (Fig. 3). January 31, 1924, under local anesthesia, the bony hump was rasped off. The incision was made inside the left nostril about 1.25 cm. above the vestibule.



Fig. 2 (Case A455091). Saddle-back nasal deformity corrected by inserting a piece of rib cartilage through an incision in the columella just below the tip of the nose.

Through this incision, by means of small, blunt-tipped, curved scissors, the skin and subcutaneous tissue was elevated over the bridge of the nose. The bony hump was then rasped off by means of specially made rasps of varying coarseness, which are carried up through the incision, and the bone removed. Following the removal of the hump, gauze pressure was applied by means of adhesive plaster on

*Read before the Southern Minnesota Medical Association, Mankato, Minnesota, May 19, 1924.

the bridge of the nose. At the same time a vaseline pack was inserted into the left nostril, thus preventing the formation of a hematoma. The intranasal gauze pack was removed after twenty-four hours, and the pressure removed from the outside of the nose after three or four days (Fig. 4).



Fig. 3 (Case A454026). Nasal hump.



Fig. 4 (Case A454026). Postoperative picture. The hump was rasped off through an incision inside the left nostril by specially shaped rasps.

Comment.—While there are various methods of removing bony nasal humps, the method of rasping them off through an incision inside the lateral wall of the nose is most satisfactory, as it eliminates entirely any external scarring. Infection has occurred in only one case; this was readily taken care of with hot dressings and did not interfere with the cosmetic result.

CASE 3 (A118722). *Angioma of the nose and cheek.*—The patient was brought for examination November 7, 1914, for an angioma of the left side of the nose and cheek. It had been noticed at the age of two weeks. The child had had multiple operations, silk-worm sutures being used outside the cheek in an attempt to scar down the angioma. At the time of examination, there was an extensive angioma of the left cheek, bulging the left side of the nose and extending into the inner canthus. It was impossible to make out the complete outline of the nose. There was marked scarring over the tumor, the result of the repeated operations (Fig. 5). Radium treatment was advised, most of which was given by inserting radium directly into the tumor. A small incision was made into the normal tissue, either inside the mouth or outside the cheek, at some distance from the tumor, and then by means of a curved, small forceps, a channel was made into the center of the tumor, and a radium tube attached to a silk thread inserted directly into the tumor. These treatments were repeated no more often than every three months, the usual dosage being in a 25 mg. tube, left in place for from five to ten hours. September 16, 1919, a pedicle flap was brought down from the left temporal region to correct partially the ectropion of the lower lid, the angioma having been entirely destroyed by the radium (Fig. 6).



Fig. 5 (Case A118722). Cavernous angioma of the nose and cheek. Note the scarring over the surface from previous operations.

CASE 4 (A218918). *Angioma of the nose.*—The child came to the Clinic January 11, 1918, because of an angioma of the tip of the nose, 2.5 cm. in diameter; she was perfectly well otherwise. The angioma affected the entire tip of the nose, causing marked deformity (Fig. 7). January 15, 1918, a 25 mg. tube of radium was inserted directly into the angioma through a small incision at the juncture of the nose and left cheek. The radium was left in place for twelve hours. No other treatment was given. Figure 8 shows the patient six years later, nothing further having been done for the condition.

Comment.—Radium is specific for cavernous angiomas. In 1917 I reported a group of cases illustrating this fact. Previous to this time, Abbe and others had used it in this type of condition with good results. In infants and young children the results are much more satisfactory than in

adults. The most satisfactory method of treatment is inserting a small radium tube directly into the center of the tumor through a small incision in the skin or mucous membrane, some distance from the tumor. This allows a valve-like action of the skin between the incision and the tumor, which prevents bleeding. The results in all of this group of cases have been very satisfactory.

CASE 5 (A454995). *Full thickness graft replacing basal-cell epithelioma of nose.*—The patient came for examination February 11, 1924, with a lesion over the bridge of the nose, of five years' duration. Various types of treatment had failed to afford relief. There was a thickened lesion over the bridge of the nose about 5 by 3.75 cm. The skin was movable. The condition was a basal-cell epithelioma of rather a low grade type (Fig. 9). February 14, 1924, the lesion was widely excised and the skin replaced with skin from the back of the right side of the neck. Gauze pressure was applied for ten days and the entire area of the



Fig. 6 (Case A118722). The same patient five and one-half years later. Tumor was removed by means of repeated radium treatment. The scarring of the cheek is the result of previous operations.

graft adhered, except for one small area over the bridge of the nose, apparently the result of too much pressure. This, however, epithelized quickly (Fig. 10).

Comment.—This case illustrates the value of full thickness grafts in replacing low grade, basal-cell epitheliomas. It should not be used in cases of active basal-cell epitheliomas if there is any likelihood of recurrence. It is much more satisfactory than the use of a pedicle flap, and saves the patient at least six weeks' time in the hospital. The graft being taken from the back of the neck is practically the same color as the rest of the skin about the nose, so that the cosmetic result is exceptionally good. Keller, Parce, Blair and others, have called attention to the value of such grafts.

Full thickness grafts are used on the face and neck wherever there is sufficient supporting tissue to allow of firm pressure after operation, as in



Fig. 7 (Case A218918). Cavernous angioma of the tip of the nose.

corrections of ectropion of the lips, the excision of scars about the face, following the removal of an inactive basal-cell epithelioma where a plastic closure is impossible, in correcting the scarring of the chin and neck, and in grafting the distal end of pedicle flaps where a double epithelized flap is required. The graft is cut from the neck or leg, the same size as the area to be grafted. This is done by using a pattern. The grafts are used without fat, and sutured in place with dermal sutures. Gauze is applied evenly over the graft and firm pressure applied with adhesive plaster. The part is kept absolutely immobile for at least ten days, and the dressing is not removed before that time. It is best to use the grafts on fresh, clean wounds. The grafts may be made up to 7.5 cm. in diameter; I do not believe it advisable, as a rule, to use the



Fig. 8 (Case A218918). The same patient five years later, following one radium treatment.

grafts much larger than this on account of the difficulty of keeping them under even pressure. It is best to make repeated grafts rather than to at-



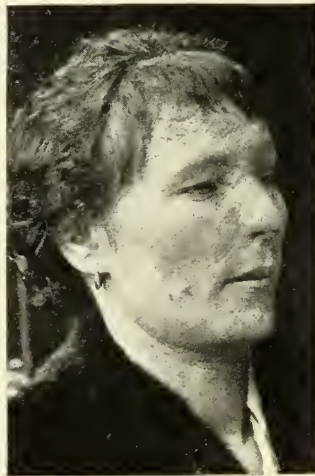
Fig. 9 (Case A454995). Basal-cell epithelioma of the bridge of the nose.



Figs. 11 and 12 (Case A445324). Loss of part of the lower third of the nose following lupus, and the use of a plaster.



Fig. 10 (Case A454995). The postoperative result after excising the basal-cell epithelioma and replacing it with a full thickness graft from the neck.



Figs. 13 and 14 (Case A445324). Nose built up by means of a pedicle flap from the forehead with a full thickness graft on the distal end. Note the fact that the vestibules of the nostril are open, owing to the use of the full thickness graft.

tempt to use too large ones. It is not advisable to try them on the neck in very young children on account of the difficulty of keeping the part absolutely quiet for the required period. If it is attempted, it is best to keep the child in a Bradford frame, with lead shot bags on either side of the head to prevent movement. I believe that the essential points are: to cut the graft free from fat, to have the area to be grafted dry, to apply firm, even pressure over the graft, and to keep the part absolutely immobile, not disturbing the dressing for at least ten days.

CASE 6 (A445324). *Loss of part of lower third of nose.*—

The patient came to the Clinic October 23, 1923, for reconstruction of the nose, which had been destroyed by a plaster and by lupus. The lupus had started three years before, and she had had various types of treatment, including x-ray. She obtained a plaster from a peddler and applied it herself; this caused most of the deformity (Figs. 11 and 12). The patient was well otherwise. October 29, 1923, a pedicle flap with the pedicle just to the right of the median line of the forehead, and the flap extending up to the left forehead, was outlined and elevated, under local anesthesia, and a full thickness graft inserted underneath the distal end. About two weeks later, the full thickness graft having taken perfectly, the flap was elevated. Three days later, it was brought down in place over the nose, and after the margins had been freshened, and sutured in place

over what was left of the columella, was attached laterally to what remained of the ala. December 10, 1923, after a preliminary cutting off of the pedicle in stages, this cutting off was completed, the distal end of the flap sutured back in place on the forehead, and the flap over the nose sutured in place. The patient was then allowed to go home for three months as the nose appeared quite large. She returned March 8, 1924, and the superfluous part of the flap was trimmed down in three stages, to improve the appearance. Figures 13 and 14 show the patient April 4, 1924, shortly after removal of the sutures. Note the fact that the use of the full thickness graft underneath the distal end of the flap has maintained a good right nostril (Figs. 13 and 14).

Comment.—By far the most satisfactory place to secure a pedicle flap for reconstruction of part of the nose is from the forehead. Taking the flap from the cheek causes unnecessary scarring, and the color of the flap from the neck is not as satisfactory as that obtained from the forehead. In order to obtain an open nostril in these cases, the use of full thickness grafts underneath the distal end of the flap is very essential. The full thickness grafts are more satisfactory than the Thiersch grafts for this purpose. It is best to delay the final shaping up of the nose for at least three to six months after the flap has been sutured onto the nose, on account of the shrinkage that takes place.

An Anesthetic Monopoly.—U. S. patent 1,491,740 was issued April 22, 1924, and was assigned by the patentee to the S. S. White Dental Manufacturing Co. The specifications of the patent describe a process for making a nearly anhydrous nitrous oxid. The patentee claims patent rights, not only on his process for reducing the moisture-content and in nitrous oxid manufactured by that process, but on all nitrous oxid whatsoever conforming to the arbitrary standards stated in his claims, no matter how manufactured. The process, if novel, is presumably worthy of patent protection. But nitrous oxid has been recognized as a chemical entity since 1776, and it has long been possible to reduce by various processes the moisture-content incident to its manufacture. By what process of reasoning the patentee claims to have "invented" nitrous oxid of low moisture-content and how the patent office came to concede his claim, are beyond the comprehension of persons not versed in the mysteries of patent logic and patent law. It would not be to the public interest for any concern to obtain a monopoly on nitrous oxid free from moisture. It is to be hoped that the S. S. White Dental Manufacturing Company will not be able to secure a monopoly on dry nitrous oxid (Jour. A. M. A., July 26, 1924, p. 287).

THE CONDUCTION MECHANISM OF THE HEART*

OLGA S. HANSEN, B.S., M.D.

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The change observed in titles of papers on conditions of the heart and circulation in the last few years is most striking. Instead of being concerned with the purely structural changes of the muscle and valves of the heart and writing about valve lesions and their results in the pumping power of the heart, physiologists, anatomists and clinicians are thinking and investigating in terms of the origin and spread of the impulse that makes the heart act as a pump. The strides that have been made in overtaking the truths of the physiology and pathology of the heart-beat are enormous when it is noted that the condition of auricular fibrillation with which all clinicians are now familiar was first analyzed and explained by Lewis in 1909, and that the electro-cardiograph was first used by Einthoven in 1903.

In order to understand the conduction mechanism of the heart as it has been proved to exist, and to realize the relation of the different parts to each other, it is well to trace its development from its fetal beginning.

Early in embryonic life the large veins, called the Ducts of Cuvier, or common cardinal veins, bringing the blood from the head and the body, unite, and in uniting form the sinus reuniens, which in turn empties into the primitive one-chambered auricle. This sinus corresponds closely to the sinus venosus of the frog, which is a chamber into which the large veins empty and is separated from the auricle by the venous valves. Later, as the auricle is divided into two chambers and the heart grows in size, the sinus reuniens does not grow but is incorporated into the body of the right auricle at the point of junction with the superior vena cava. It is thought that the remains of this primitive tissue form the pacemaker of the mammalian heart. In harmony with this view is the fact that in the frog a ring of specialized tissue is found about the bases of the venous valves (between the sinus venosus and the auricle), and incomplete portions of such a ring are found in the higher animals at the points

*Read by invitation before the Consulting Medical Staffs of the Lymanhurst School for Tuberculous Children and the Parkview Sanitarium, November 27, 1923.

corresponding to the remains of these valves. In the frog the contraction of the heart originates in the sinus venosus, giving more force to this theory of origin of the pace-maker of the mammalian heart.

In the human and other mammalian hearts a small collection of peculiar muscular tissue, arranged in a complicated network bound together by connective tissue, is found at the junction of the superior vena cava with the right auricle and corresponds in location to the right branch of the embryonic veins. It is known as the sino-auricular node, or node of Keith and Flack, after the workers who described it. A second similar collection is found in the wall of the auricle at the base of the septum, in the neighborhood of the coronary sinus, and represents the left branch of the embryonic veins. This is known as the auriculo-ventricular node, or node of Tawara, and is the beginning of the connection between the auricle and ventricle.

From this auriculo-ventricular node a heavy band of specialized tissue known as the bundle of His, or the auriculo-ventricular bundle, passes down the ventricular septum and forks to the right and to the left ventricles. The fibres branch out into a complicated arborization which lines the ventricular cavities, and end in a network of Purkinje fibres, consisting of cells without striation and with large pale nuclei, lying just below the endocardium.

The bundles and fibres are covered with connective tissue sheaths, and the nodes in the auricle are richly supplied with blood-vessels and nerves.

In brief the conduction mechanism of the heart consists of remains of embryonic tissue collected in dense nodes held together by connective tissue, in the auricles, and of strands of specialized muscle fibres arranged in a parallel manner passing from auricle to ventricle and then branching out as a network into the ventricular muscle. It is thought that the primitive muscular tissue acted without nerves in the beginning but, as the nerves were supplied during fetal growth, they took over more and more control of the mechanism. The function of these collections of specialized tissue is to originate and transmit impulses, although it must be noted that any part of the heart muscle can perform these functions, with some degree of success.

The sino-auricular node, corresponding to the

remains of the right embryonic vein, is known as the pace-maker of the heart. Each normal heart-beat originates here and travels through the auricular muscle as an excitation wave, causing contraction of this chamber. The rate at which these impulses are sent down depends on the influence of the vagus and accelerator nerves in modifying the intrinsic rate of the node. The impulse spreads through the auricular muscle at the rate of 1,000 millimeters per second, in a circular motion, which has been likened to the widening circles made when a stone strikes water.

It is then carried by the auriculo-ventricular node and bundle to the ventricles and from here the impulse spreads from within outward, by means of the Purkinje fibres, which carry the impulse at a rate of 5,000 millimeters per second, five times as fast as the rate of spread through the auricle and ten times as fast as the rate of conduction through the ventricular muscle if stimulation is applied to the pericardial surface, instead of to the endocardial surface where the Purkinje fibres are located. These fibres carry the impulse so rapidly that the contraction of the ventricle is practically simultaneous, whether in the thickest or the thinnest parts of the ventricle. It is of interest to note that the conduction rate is most rapid through the parts of the conduction system richly supplied with glycogen, that is the Purkinje fibres, and that the breadth of these fibres is greater than that of any others. The glycogen content is less in the auricle, the ventricle, and the auriculo-ventricular node, in the order named, and the breadth of fibre is correspondingly less. At the same time the rate of conduction is slower in the auricular muscle than in the Purkinje network; in the ventricular muscle than in the auricle; and there is evidence that the auriculo-ventricular node has the lowest conduction time of all.

The nerves affect the action of the heart through the nodes in the auricle. The right vagus influences the sino-auricular node. The sino-auricular node is the pace-maker and so stimulation of the right vagus slows the heart. The left vagus influences the auriculo-ventricular node. This node is the beginning of the junction between the auricle and the ventricle, and so stimulation of the left vagus causes blocking of conduction between the chambers. Actually fibres from the vagi are so mingled that the action is not quite so clear-cut as the embryonic origin might indicate. Experiment-

ally stimulation of the left vagus affects both nodes about equally although the right nerve seems to be more specific in its action. The accelerator nerves have the same distribution of effect. Many physiologists have found that stimulation of the right accelerator nerve causes an increase of rate, while when the left nerve is stimulated contractions occur simultaneously in the auricle and ventricle, because of the overaction of the auriculo-ventricular node. Again this can be traced back to the distribution of the right nerve to the embryonic region, corresponding to the right vein in the embryo, and of the left to the auriculo-ventricular node corresponding to the embryonic left duct of Cuvier. Experimental heart-block is then produced by a change in the conducting power of the main neuro-muscular tract uniting the auricle and ventricle, by injury, by disturbed innervation, or by poisons.

In summary, the cardiac contraction originates with an impulse from the pace-maker, the sino-auricular node, passing as an excitation wave through the bands of auricular muscle. Then it is carried through the junctional tissues, the auriculo-ventricular node, the bundle of His and its branches to its arborization in the interior of the ventricle. The Purkinje fibres beneath the endocardium transmit the impulse to the ventricular

muscle, and so rapid is their rate of conduction that the spread through the ventricles is almost simultaneous, resulting in a contraction of the ventricle as a whole.

Once the contraction wave has passed and systole has occurred the heart muscle settles down to a diastolic period of refractoriness, and is then ready to respond to the next impulse which arises when sufficient contractile energy has been stored up. The vagus acts as the inhibitor and keeps the rate slow enough to bring about effective contractions. The balance between the vagus and the accelerator nerves maintains the rate best suited for the organism under all circumstances of rest and of exertion.

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THE RISING TIDE OF BUREAUCRACY

A direct and immediate consequence of the over-multiplication of regulatory and inquisitorial laws is a corresponding increase in the number of offices and office-holders.

It is a profound mystery why the people of the present generation should so violently run after the very things which their forefathers so violently ran away from in 1776.

One of the chief indictments of King George set forth in the Declaration of Independence reads:

"He has erected a multitude of new offices and sent hither swarms of officers to harass our people and eat out their substance."

Can we believe that the signers of that historic Declaration would have been so ready to pledge their "lives," their "fortunes" and their "sacred honor" to its defense if they could have foreseen that a later generation would voluntarily consent to the creation of bureaus and commissions and to the appointment of officers a hundred-fold greater in number than King George and the British Parliament ever thought of imposing upon the Thirteen Colonies?

A recent authority has estimated that within the period in which the population of the United States increased ten per cent the number of persons holding civil office increased forty per cent, that the amount paid in salaries increased one hundred and fifty per cent, and that of males

old enough to hold a job one in every forty-seven is now in some kind of government employment.

The same authority estimates that of the total revenue collected by the U. S. Government, one dollar in every five is paid out in salaries, and that the total salary list of the Federal Government is now approximately equal to \$10.00 for each and every man, woman and child of the entire population, without including the sums paid to the immense army of state and municipal employees. At the present rate of increase, two more decades will see one adult in every ten holding some kind of public office, and paid from taxes collected from the other nine.

The growth of bureaucracy, like the growth of every other governmental evil, has been insidious. Always it has been concealed under the cloak of *pro bono publico*. Always the movement is alleged to be in the interest of public health, public safety, public morals, or is designated by some other fine sounding title. Most of those who advocate and those who assent to the creation of new offices are animated by the best of motives. The road to bureaucracy, like the road to perdition, is abundantly paved with good intentions.—*From an address delivered at the 24th annual Convention of the National Association of Retail Druggists, Detroit, Sept. 26, 1922. Reprinted from the Midland Druggist and Pharmaceutical Review.*

THE CLASSIFICATION OF THE IRREGULARITIES OF THE HEART*

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St. Paul

Irregularities of the heart are so frequent, and their presence is so readily detected, that it is necessary to differentiate the various forms and to know their significance. An irregularity may be of no importance or it may mean a grave heart condition, and unless the underlying cause is recognized the patient may either have a serious heart lesion overlooked or he may be unnecessarily worried and subjected to a regime that will prevent him from living an otherwise useful normal life.

In order to readily arrive at a diagnosis it is essential to have some method of classification. Several classifications have been suggested by various authors but it is not within the scope of this paper to consider all of them and I have arbitrarily chosen the classification as suggested by Lewis in 1911 as the most practical for the present purpose.

The various irregularities of the heart will be taken up under the following headings:

1. Sinus Arrhythmia.
2. Premature Contractions. (Beats of ectopic origin or extra-systoles.)
3. Paroxysmal Tachycardia.
4. Auricular Flutter.
5. Auricular Fibrillation.
6. Heart Block.
7. Alternation of the Pulse.

1. *Sinus Arrhythmia*. — Sinus arrhythmia is that almost universal and relatively unimportant acceleration and slowing of the heart rate that accompanies normal respiration, being most marked in young individuals. Sinus irregularities are produced by interference with the rhythmic impulses at their origin and discharge. Normally the stimulus to contraction arises in the sino-auricular node, which lies in the upper anterior end of the sulcus terminalis. The sulcus terminalis runs from the junction of the right auricle and superior vena cava toward the inferior vena cava. This node consists of a specialized network of muscle cells and is richly supplied with the nerves of the heart. The contraction which starts in this node spreads

through the walls of both auricles to the auriculo-ventricular node and is then transmitted by the auriculo-ventricular bundle of His to the ventricles. The normal heart rate averages about seventy-two beats per minute and is under control of the vagi or inhibitory nerves of the heart. Many times the vagi act with excessive inhibition either persistently or spasmodically and the result is a uniform slowing or an intermittent slowing.

2. *Premature Contractions*. — Premature contractions, or extra-systoles as they are better known, and which terms will be used interchangeably in this symposium, are the results of impulses arising from a new site which may be located in the auricles, ventricles, or conduction system. Normally the impulse begins at the sino-auricular node, travels down the auricles to the A-V node and then through the bundle of His and its branches and is distributed simultaneously to the musculature of both ventricles. In premature contractions, or extra-systoles, the impulses are named according to their point of origin, as auricular extra-systoles, ventricular extra-systoles, etc. Extra-systoles occur before the regular time and disturb the normal rhythm of the heart, except in the interpolated forms. The contraction starts abruptly and travels quickly and in general does not tend to repeat itself. *Etiology*: This condition occurs in any cardiac disease where the walls of the heart are dilated or the heart is working against a high pressure; also in toxemic conditions due to digitalis, gastro-intestinal infections and the bacteria of the acute infectious diseases.

3. *Paroxysmal Tachycardia*. — Paroxysmal tachycardia is a condition of sudden acceleration of the heart rate. The abnormal focus is usually situated in the auricle and the normal sequence of contractions is maintained. A paroxysm may last a few beats and recur from time to time or it may last for hours or days. The attack begins and ceases abruptly. *Etiology*: Attacks occur at all ages and excitement or emotional disturbances are the chief excitants of an attack in those predisposed.

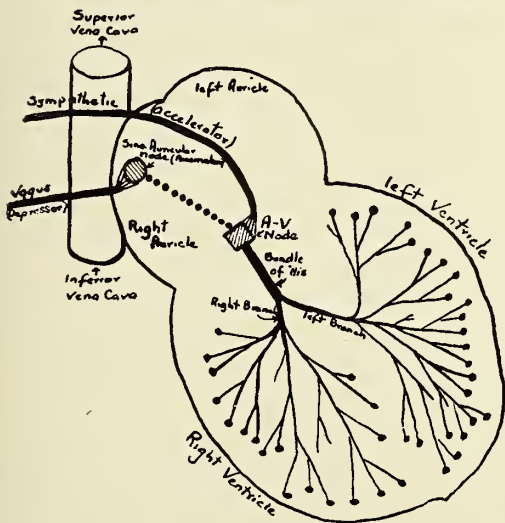
4. *Auricular Flutter*. — In auricular flutter the normal beats of the auricles are submerged by contractions of this chamber in response to a series of new impulses varying in rate from 200 to 350 per minute. "Our knowledge of clinical auricular flutter is too incomplete to permit of more than

*Presented before St. Paul Clinic Week, St. Paul, January, 1924.

speculation as to its exact nature. Reasons for believing that heterogenetic impulses stand to it in the relation of a causal factor have been adduced. It has to be borne steadily in mind that the condition is closely connected with fibrillation. It possesses a curious quality, namely, a tendency to persist in circumstances where the exciting cause appears to be no longer at work. In this it resembles fibrillation" (Lewis). Flutter is comparatively rare, is seen for the most part in the sixth and seventh decades of life and is always associated with heart block. *Etiology*: There is no apparent relation to the infectious diseases, but at times there is association with arteriosclerosis.

CONDUCTION SYSTEM OF HEART.
(Diagrammatic)

THE SINO-AURICULAR NODE(PACEMAKER) LOCATED IN THE RIGHT AURICLE AT THE JUNCTURE OF THE VENA CAVA, INITIATES EACH NORMAL IMPULSE TO CONTRACTION. FROM HERE THE IMPULSE SPREADS OVER BOTH AURICLES ARRIVING, BY THE SHORTEST ROUTE, AT THE AURICULO-VENTRICULAR NODE(BETWEEN AURICLES AND VENTRICLES). THIS IN TURN BECOMES ACTIVATED AND SENDS AN IMPULSE ON TO THE VENTRICLES THRU THE BUNDLE OF HIS. A BRANCH OF THIS BUNDLE GOES TO EACH VENTRICLE, AND SUB-DIVISIONS PROVIDE FOR THE SPREAD OF THE IMPULSE SIMULTANEOUSLY TO ALL PARTS OF BOTH VENTRICLES



5. *Auricular Fibrillation*.—Auricular fibrillation is a condition of total irregularity in rate, force and rythm of the heart, formerly referred to as delirium cordis or pulsus irregularis perpetuus, caused by stimuli from multiple foci in the auricles. There is no auricular systole, the

auricles being in diastole and fibrillating. The ventricles react only to a portion of the stimuli starting down the conduction system. *Etiology*: There are two general classes of cases where this condition is noted, i e., in mitral stenosis and when myocardial damage has occurred. Syphilis is not an etiological factor per se.

6. *Heart Block*.—In this condition there is a delay in or absence of response by the ventricle to impulses from the auricle. In the normal heart the auricular systole sends an impulse along the bundle of His to the ventricle. The bundle of His starts in the right auricle near the coronary sinus and proceeds forward and downward to the membranous septum of the ventricles, where it divides into two main branches, one on either side of the septum. The main branches then subdivide and are connected to the musculature of the ventricles through the complicated network of cells named after Purkinji. Whenever there is a disturbance of function in the bundle of His there is a disturbance in the normal beats of the heart. There may be a simple delay in the conduction time through the bundle of His. If the delay is prolonged sufficiently the ventricles fail to respond to some of the auricular impulses and we have the so-called dropped beats. The dropped beats produce a pause that breaks the normal rythm of the ventricle. As the degree of heart block increases the ventricular silences become more frequent and relatively simple ratios are established between the auricular and ventricular rates. With half the auricular impulses coming through we have a 2:1 heart block. This ratio may reach 4:1. In complete block no impulses from the auricles reach the ventricles, and each take up their own rate, which is 72 for the auricles and 33 for the ventricles. *Etiology*: This condition occurs at any age, predominating in males. It follows severe damage from rheumatic fever, chorea, and senile affections. The condition is not infrequent during the course of acute infectious disease. Syphilis is also one of the outstanding causes of heart block. The great bulk of the cases can be placed either in the rheumatic or the syphilitic group and in either case they are an expression of a deep seated and widespread affection of the heart muscle. In elderly people the condition often cannot be attributed to the above causes and is due to senile changes in the heart muscle itself. Block is also sometimes associated with metastatic car-

cinoma of the bundle of His. Digitalis is one of the prominent causes of heart block. Pathologically the main bundle of His or its branches or its auricular attachment are the seat of the lesion.

7. *Alternation of the Pulse.*—Alternation of the pulse is a condition in which the left ventricle while beating regularly expels larger and smaller quantities of blood. There is alternation of the pulse beats so that every other one is smaller or larger than the one just preceding. This condition is of obscure origin and the disturbance is dependent upon some unexplained anomaly of the ventricular systoles. The contractions of the ventricle are regular and each is preceded by a regular auricular contraction. *Etiology:* This condition is seen in two classes of patients: where the heart rate is unduly accelerated as in paroxysmal tachycardia, and in normal rates in elderly subjects. Males show a distinct preponderance. Pathologically there are no typical lesions. The condition has been noted in angina, hypertension, renal disease and fibrotic myocarditis.

"We must return to the basic idea that the granting of the degree of Doctor of Medicine means that a student is capable of handling the ordinary problems of general practice. This is certainly necessary before he can be safely trusted to advance in any special field. In the ordinary small community we find the general merchandise store. One can obtain here the essentials of human life in ordinary existence. If one wants any special appliance or something unusual it takes time to obtain delivery and one must either send or go to a larger field. This illustrates general practice and also the requirements for every medical man. In our larger centers we have the department store, where there is a marked extension of everything represented in a general merchandise store with experts in charge of each department. Medicine likewise is handled in this way where specialists in various lines are available. In the general merchandise store the proprietor knows everything that he has on hand and how to guide his customer to get promptly the essential things that he needs. In the general department store much is left to the customer himself. Without guidance he may over-purchase in a single department when his real needs lie in another. It is inevitable that there shall be these two forms of organization. One of the ways to protect the person who deals largely with specialists is to have the specialist understand thoroughly the essentials of general medical practice."—Extract from address by Dr. Ray Lyman Wilbur, President-elect of the A. M. A., at annual meeting of the California State Medical Society, May 16, 1922.

THE INSTRUMENTAL RECOGNITION OF CARDIAC IRREGULARITIES*

HAROLD E. RICHARDSON, M.D.

St. Paul

It has only been through the instruments of precision, the electro-cardiograph and the polygraph, that we have been able to determine the true nature and variety of the cardiac irregularities. We are all familiar with the terms "delirium cordis" and "extra-systole," which are remnants of our early clinical knowledge and which as the result of the use of these instruments are now more accurately recognized as "auricular fibrillation" and "premature contraction" respectively.

Because of its extreme delicacy and accuracy of definition, the electro-cardiograph stands in a class by itself in the study of the heart, particularly of the irregularities of this most vital organ. In this regard also, its co-partner, the polygraph, occupies a secondary, but very important, position, and is used by us to supplement the information obtained by the electro-cardiograph. The polygraph, being a portable and relatively simple instrument, readily lends itself to wide-spread clinical use.

THE ELECTROCARDIOGRAPH

Modern electrocardiography was made possible by (1) the discovery of Kölliker and Müller in 1885 of the fact that an electric current was generated by each beat of the frog's heart; (2) the observation of Ludwig and Waller in 1887 that similar currents generated by the human heart could be recorded by means of a capillary electrometer; and (3) the construction by Einthoven in 1903 of an extremely sensitive modification of Ader's instrument which made possible such experimental work as placed the electrocardiograph in the clinical field and justified the manufacture of commercial instruments.

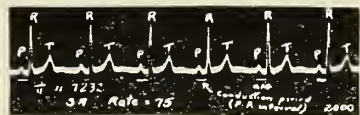
Gradually a few instruments came into use in this country, and in 1912 Dr. Charles Lyman Greene, then head of the Department of Medicine at the University of Minnesota, secured the installation there of the first electrocardiograph in the North-

*This paper combines the essential points of two papers. The first, on "Practical Electrocardiography," was presented before the Ramsey County Medical Society, November, 1923; the second, on "The Instrumental Recognition of Cardiac Irregularities," was presented at the Ramsey County Medical Society Clinic Week Symposium on "Cardiac Irregularities," January, 1924.



Horizontal white line shows diastole (rest period)

LEAD I RIGHT ARM TO LEFT ARM.



Horizontal white line shows conduction period

LEAD II RIGHT ARM TO LEFT LEG.



Arrows show auricular complex and ventricular complex
LEAD III LEFT ARM TO LEFT LEG.

Normal Electrocardiograph

No arrhythmia. The "P" and "T" waves are all of good height and upright in all leads. The conduction time is 0.16 seconds (normal limits 0.12 to 0.18 sec.). No ventricular preponderance.

west. At present there are five in the Twin Cities available to all members of our profession.

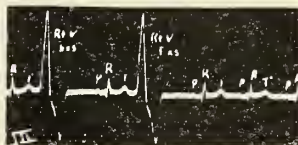
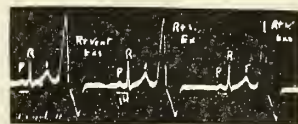
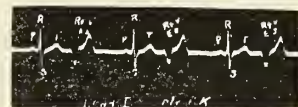
The high initial cost (about four thousand dollars) together with the heavy expense of upkeep and operation, limits the number of purchasers of this instrument to the individuals or groups who have a sufficient demand for it. Fortunately neither possession of the instrument nor familiarity with its operation is necessary inasmuch as it is the completed, permanent, photographic record *alone* that is of importance to the physician, the actual process of registration revealing nothing.

Interpretation of an electrocardiographic record is a relatively simple matter. I shall demonstrate to you later that no atmosphere of mystery need envelop the instrument or its records. Their mysterious qualities disappear under the application of quite simple interpretative formulæ. One cannot doubt the great interest that has been aroused in the profession as a whole by the tremendous advances in the effective and timely diagnosis and treatment of heart disease by this indispensable instrument of precision, and it is only to be regretted that this interest has been curbed by the lack of a knowledge so easily obtainable.

I purposely omit a detailed description of the complicated, delicate instrument itself, as that would involve a departure from the direct purpose of this paper. With respect to the actual production of an electrocardiogram, one may say that it is a moving picture of the deflections of a microscopic filament, suspended between the poles of a

powerful electro-magnet, said deflections being caused by the conduction of the electric currents accompanying and reflecting the phases of the heart cycle. To each end of the conducting filament, an electrode is connected, and between these two electrodes the patient is placed, completing the circuit. The "so-called" action currents can be *led* across different portions of the heart and off from the body, according to the placing of the electrodes, hence the term "lead," of which there are three in regular use, indicated always by the Roman numerals I, II, III. Lead I gives the electrical activity of the heart as viewed from the top, i.e., across the auricles, and to obtain it the electrodes are placed on the forearms. Lead II gives the electrical activity of the heart through its main diagonal and necessitates placing the electrodes on the right arm and left leg. Lead III gives the electrical activity of the left side of the heart, the electrodes being placed on the left arm and left leg. You will see the necessity and importance of these three leads in following with me the lantern slides which are now to be shown.

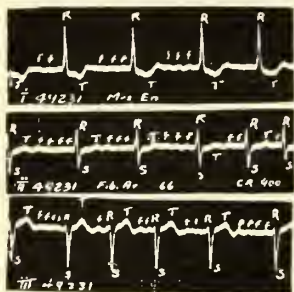
No one should be permitted to get the idea that an electrocardiogram represents a complete, ready-made diagnosis of a heart condition. The electrocardiograph, like the x-ray, is a vital necessity in all careful and accurate studies of the heart. While it, like the x-ray, is absolutely indispensable to a complete cardiac examination, it in no way displaces or lessens the value or necessity of the classical clinical methods, but is, rather, an adjunct to



Right Ventricular Extrasystoles

In this case they follow each normal heart cycle. Evidence of the normally occurring auricular contraction is wholly buried in the diphasic extrasystolic wave as is usually the case. The "regularity" of the "irregularity" as reflected in the pulse is very confusing.

them. The information it supplies is exact and precise, and while it may at times simply confirm and amplify the clinical conclusions, it goes much further, giving vital facts such as are impossible to obtain by any other means. It shows not only the



Misleading Type of Auricular Fibrillation (lacking delirium cordis)

The "P" wave is absent. Multiple coarse undulations (fibrillatory waves) fill the diastolic period. Note that the ventricular rate is only 66 and that the "R" waves occur almost rhythmically. Lacking an electrocardiogram, this type of fibrillation is often unrecognized clinically, or is interpreted as a mere Sinus Arrhythmia. Pulse likely to be termed "regular," but a curious hesitant quality is apparent to one familiar with this not uncommon type. Strikingly good compensation may be attained without abolition of the auricular fibrillation in such cases.

exact heart rate and rhythm, but *exactly defines* any arrhythmia present, reveals the existence of ventricular preponderance, asynchronism of the ventricles, auricular hypertrophy, auricular pathology, auricular fibrillation no matter how masked or obscure clinically, ventricular fibrillation, auricular flutter, paroxysmal tachycardia with its point of origin, and sometimes the presence of the "drop" type of heart and alternation. It also shows the presence of hypotonus of the heart muscle, suggests the presence of chronic myocarditis and hyperthyroidism, and offers certain aids in evaluating heart muscle strength. It gives its most valuable information in its revelation of the presence of: (1) delayed conduction; (2) heart block of the ordinary type whether partial or complete; (3) sino-auricular and branch-bundle block; (4) defects in the arborization fibers; and (5) over-digitalization. It helps greatly in prognosis. It often unmasks silent, insidious heart lesions of middle age, otherwise undetectable, by unveiling branch-bundle block, arborization defects, and certain specific "T" wave inversions indicative of a grave heart condition. Our routine use of the polygraph has long since demonstrated its great value, but both in scope

and exactitude it is distinctly inferior to the electrocardiograph.

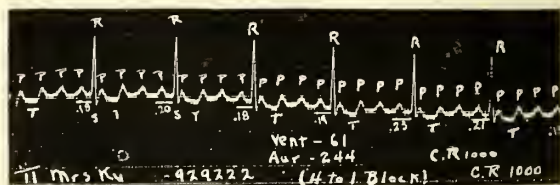
The electrocardiograph gives no direct information concerning the heart size, the valvular lesions, murmurs, the nature of heart tones, blood pressure, or decompensation. These are to be determined and evaluated by the other clinical methods. On the other hand, those conditions within the heart which are most obscure and least readily revealed by the usual diagnostic methods constitute the field par excellence of the electrocardiograph. Not only does this instrument give us a means of rounding out a diagnosis, but again and again it reveals the presence of a dangerous and wholly unsuspected heart lesion, unrecognizable by other methods of cardiac investigation.

In closing I would summarize as follows:

1. Interpretation of an electrocardiogram and a polygram is a relatively simple matter.
2. Both electrocardiogram and polygram are permanent records, giving within their scope most valuable and exact information concerning the heart's action.
3. Neither instrument furnishes a complete, ready-made diagnosis of a heart condition.
4. They do give vital information concerning the heart, of a sort that cannot be obtained by any other means.

It is obvious that both of these instruments make possible more accurate, scientific diagnosis, more intelligent prognosis, and more timely and effective treatment.

The writer wishes to express his grateful appreciation to Dr. Charles Lyman Greene for his careful



AURICULAR FLUTTER WITH FOUR TO ONE HEART-BLOCK

Auricular rate 244. Ventricular rate 61 (four "P" waves to each "R" wave), case of auricular fibrillation under Quinidine, passing to "flutter" (here shown), then to normal rhythm, and later relapsing into fibrillation.

criticism of this paper and his many helpful suggestions in its writing.

THE POLYGRAPH

This instrument consists of a double clockwork device which drives a narrow strip of paper under

the recording pens at a uniform rate of speed and simultaneously records the time in fifths of a second. One writing pen records the radial pulsations, the other the pulsations of the jugular vein,



Complete Heart Block

The auricles and ventricles are contracting regularly but entirely independently and at totally different rates. Note that the "P" wave, indicating auricular contraction, occurs at regular intervals and that the "R" and "T" waves, indicating ventricular activity, also occur regularly, but there is complete dissociation between them and the rate of the former is 75, while that of the latter is 66, an unusually rapid idio-ventricular rhythm. Usually the ventricular rate in complete block is 40 per minute or less.

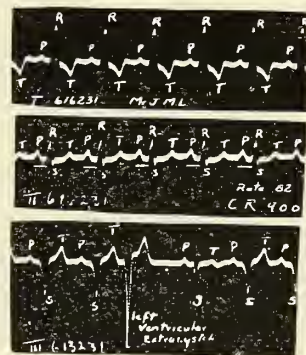
Accurate diagnosis is possible only with instrumental methods of investigation.

as the record is usually taken. The normal tracing of the radial pulse consists of a series of single waves corresponding to the ventricular contractions. The normal jugular record is made up of a series of three chief waves for each radial pulsation, these waves being called the "a," "c" and "v" waves respectively. The "a" wave is produced by the systole of the right auricle; the "c" wave is due to the contraction of the ventricle, and the "v" wave reflects the distention of the large veins due to the accumulation of blood after the right auricle has become completely filled in diastole. The "v" wave is an evidence of stasis and is increased by all factors which tend to increase the amount of blood in the right auricle, such as high arterial tension, tricuspid regurgitation, etc. Variations from the normal in the character, time of occurrence and the sequence of the various waves readily defines any and all cardiac irregularities. Thus with an auricular premature contraction all waves of the normal cycle are present in their usual sequence, but all occur prematurely. With a premature contraction of ventricular origin, where the rhythm of the auricle is undisturbed, we find a premature and immature radial thrust, and in the corresponding jugular cycle the "c" wave precedes or occurs with the regularly occurring "a" wave. In a premature con-

traction of nodal origin, where the impulse arises in the auriculo-ventricular node between the auricles and ventricles, these two chambers contract at the same time and there is found in the jugular record an exaggerated wave, representing a fusion of both the "a" and the "c" waves, corresponding in time to the premature beat in the radial record.

In complete block there is no relation between the "a" waves of auricular contraction and the "c" waves of ventricular contraction and as in this condition the auricles contract more often than the ventricles, there are many more "a" waves than "c" waves in the jugular record. With partial block, where the ventricles respond to every second, third, fourth or more auricular contractions, in the first case or two-to-one block there are two "a" waves to each "c" wave; in the second case or three-to-one block there are three "a" waves to each "c" wave; and so on. In sino-auricular block where there is simply a temporary arrest of the heart action, we find normal heart cycles preceding and following the unusually long period of diastolic rest.

In auricular flutter the "a" waves occur at the rate of two hundred or more per minute, corre-



Right Branch Block

A grave condition which can be diagnosed accurately only by the electrocardiograph. Characterized by (1) exaggerated first and third leads; (2) notched and widened "R" and "S" waves; (3) the direction of the "T" waves in first and third leads, which is opposite in direction to that of the dominant wave of each.

The side through which the impulse passes is determined exactly as ventricular preponderance is determined. The block, therefore, must be in the opposite ventricle. (Third lead shows a left ventricular extrasystole.)

sponding to the excessive rate of contraction of the auricles, and as there is usually some degree of heart-block present, there are two, three, four or more "a" waves to each "c" wave. Paroxysmal

tachycardia in which there is characteristically a sudden outburst of rapid action of the whole heart with an abrupt ending, reveals itself in the polygram by these same features. The paroxysm begins and ends with a premature contraction, usually of auricular origin.

In auricular fibrillation the radial shows the total irregularity in rate, force and rhythm. The jugular record characteristically shows no definite "a" wave, but is completely over-run by coarse fibrillatory waves. The "c" waves, being due to ventricular contraction, also show a total lack of rhythm.

It should be said also, that in addition to its value in the accurate differentiation of the cardiac irregularities, the polygraph aids greatly in evaluating heart muscle strength, in showing the various grades of venous stasis, and in demonstrating variations in the conduction time of the heart. Again and again polygraphic findings are determining factors in the proper management of a heart case.

HOW TO CHOOSE A DOCTOR

Replying to an inquirer who wants to know how to be governed in the selection of a physician, Dr. Wm. A. Brady, in the *Chicago News*, gives the following pointers for the guidance of the layman in choosing his doctor:

First, the name of the good doctor is rarely seen in print.

Second, in making examinations he requires the patient to remove clothing which may interfere with the detection of signs and symptoms.

Third, when he is out of town he is attending a medical meeting or taking a brief postgraduate course.

Fourth, he asks frequently for consultations or refers patients to colleagues for special examinations, and when his patients die asks for autopsies, all because he never gets through studying medicine. This is why he buys so many books and subscribes to so many first class medical journals.

Fifth, he prescribes simple medicines to meet particular indications at the particular time, and not "ready-made" stuff with which he has recently been "sampled." Or, perhaps, he prescribes no medicine at all, but merely lays down some common-sense rules for the guidance of his patient.

Sixth, he never guarantees or promises a "cure," because to do so would be to be dishonest.

Seventh, he is invariably a stickler for the observance of the rules of ethics.

Eighth, being an honest laborer, he deems himself worthy of his hire and demands payment.

Ninth, he does not put a patient off with the evasion, "weak lungs," nor does he perpetrate the near diagnosis, "catarrh." He makes a definite diagnosis or frankly admits his inability to do so.

Tenth, "he will do anything short of murder for a loyal patient."

IRREGULAR ACTION OF THE HEART: ITS CLINICAL RECOGNITION*

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St. Paul

Twenty-five years ago the chief interest in heart disease centered on valvular lesions and septic endocarditis. During the succeeding ten years the center of interest shifted to the heart muscle, and the capacity and integrity of the myocardium was stressed in all cases of heart disease. The last ten to fifteen years has witnessed an increase in our knowledge of the anatomical structure and physiological function of the heart. This knowledge has been manifest in a better understanding of the *conduction system* of the heart. By conduction system is meant that nervous mechanism lying within the heart itself which transmits contraction stimuli. It includes the sinus node in the wall of the right auricle where stimulus matter keeps accumulating and is discharged at regular intervals, causing contraction waves to spread over the auricles, as ripples spread from a pebble dropped into a still pool. These waves reach and stimulate a second node of nerve tissue, the auriculo-ventriculo- (or A-V node), lying on the floor of the right auricle. Impulses from the A-V node travel to the bundle of His (lying in the interventricular septum), down the bundle of His to the right and left branches which go to the right and left ventricles, the branches ramifying into a fine network of nerve fibres to all parts of the ventricles, called the arborization fibres, and ending in sensitive bulbous ends called the Purkinje system.

The vagus nerves join the heart largely in the sinus region and act as a curb to stimulus formation and discharge, in the sinus node.

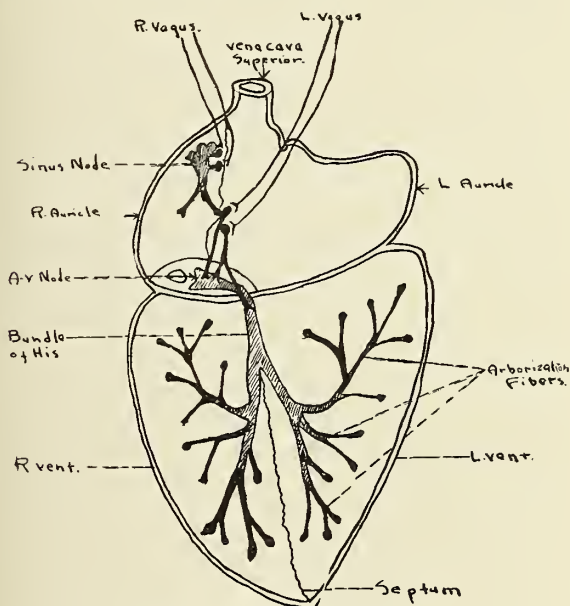
The normal cardiac cycle consists of a definite sequence of events, namely, stimulus production and discharge, auricular contraction, ventricular contraction, diastolic pause.

Systole requires three-tenths of a second while diastole occupies five-tenths of a second. During all of systole and the early part of diastole all the functions of the heart except tonicity are in abeyance, therefore the heart is in a refractory state and cannot respond to stimuli. But as diastole progresses these powers return and by the time

*Read in Symposium on Irregularities of the Heart at St. Paul Clinic Week, January, 1924.

sufficient stimulus matter has accumulated at the sinus node to cause another contraction, excitability, contractility and conductivity have been restored.

Regular action of the heart depends therefore upon the normal balance between stimulus production at the sinus node, and *excitability*, *conductivity* and *contractility* of the heart muscle. Depression or exaltation of one or more of these functions will interfere with the normal sequence of events in the cardiac cycle and thus produce irregular action of the heart.



Schematic Drawing of Heart.
Showing Conduction System.

It is evident therefore, from the foregoing remarks, that the conduction system ranks equally with the myocardium in interest and importance to the cardiologist. The wider use of the electrocardiograph is the means by which there has come a better understanding of the conduction system and has made possible a more accurate differentiation of abnormal rhythms. The use of this instrument in the recent Great War with opportunity for the study of large groups of soldiers under constant supervision and control, has given a splendid correlation between instrumental and clinical findings. Subsequent observations in civil life have largely confirmed these observations, so that today in the majority of instances we are able to accurately differentiate *clinically* the various types of cardiac irregularities. This is particularly true

of the commoner and more important types under discussion.

Sinus Arrhythmia.—This type of irregularity is frequently seen while making an examination of an excited child. There is a rhythmic variation in heart rate, the heart speeding up with inspiration and slowing down with expiration. Probably unstable vagus control is responsible for this variable rate. Occasionally with the slow heart of convalescence following a severe illness we note this same rising and falling rate associated with respiration.

A rare form of sinus arrhythmia must be mentioned which occurs independent of respiration and in which there is a slowing and acceleration of the whole heart occupying ten to fifteen seconds and occurring at variable intervals. During the long pauses no abnormal heart sounds are heard. Anything which accelerates the heart (exercise, atropine, fever) abolishes this irregularity.

While sinus arrhythmia is found chiefly in childhood and adolescence it is also observed occasionally in adults of nervous or emotional temperament and is probably due to imbalance between sympathetic accelerative influences and vagus slowing influences. Sometimes it appears to be due to heavy indulgence in tobacco.

Extra-Systolic Irregularity.—Isolated extra-systoles are not difficult to recognize. The examining finger on the pulse detects a small beat occurring too soon in diastole, followed by a longer pause than usual. On listening to the heart with the stethoscope one hears three to four sounds, namely, the first and second sounds of the normal beat plus the sounds produced by the extra beat. If the extra-systole has not sufficient force to open the aortic and pulmonic valves then only three sounds are heard.

Patients may be unconscious of the occasional extra beat but frequently when extra beats become numerous they cause distress and anxiety, particularly in young, nervous, high strung individuals. These people experience a fluttering of the heart associated with momentary dizziness, and a sensation as though the heart had turned over and then stopped sometimes associated with precordial pain. During the diastolic pause they complain of a weird sensation of emptiness in the chest. If the extra-systoles are numerous and occur at short intervals the patients may feel ill and depressed.

Extra-systolic irregularity when marked may

have to be differentiated from auricular fibrillation and to do this a few short rules will suffice.

1. In extra-systolic irregularity there are always periods of normal rhythm.

2. The total heart rate is rarely above 120 beats per minute. An irregular rate greater than this is suggestive of fibrillation.

3. Exercise causes extra-systoles to disappear or to be greatly reduced in number.

4. In auricular fibrillation exercise increases the irregularity and causes the rate to rise.

Patients who are susceptible to marked extra-systolic irregularity occasionally experience times when the extra-systoles are not relieved or reduced by exercise, but instead the rate seems to rise, the heart to slam violently and a sensation of weakness and exhaustion supervene. This history is suggestive and if the patient is examined at this time he will, in all probability, be found suffering from an attack of transient auricular fibrillation.

Paroxysmal Auricular Tachycardia.—This consists of bursts of rapid regular action of the whole heart of sudden onset and sudden offset, due to an abnormal focus of impulse formation arising somewhere in the auricle outside the sinus-node. During the attack the new center dominates the movements of the whole heart, the influence of the pace-maker being temporarily lost. The heart at this time is but slightly under vagus control and such factors as emotion, exertion, rest or sleep, which materially affect the normal heart rate, do not modify the rate during an attack. Attacks may last seconds, minutes, hours, days, and may occur at varying periods for many years, the heart, during the free interval, in most cases showing no abnormalities. The rate during an attack may be anywhere between 110 and 200 per minute, the usual levels running between 140 and 190 per minute. Often paroxysmal tachycardia must be differentiated from the high rates in such affections as goiter, alcoholism and tuberculosis, but the presence of these diseases can be ascertained and the reaction of the heart to posture, exercise, and rest observed in differentiation.

Summary of Clinical Recognition.—If we find a patient in an attack of palpitation with (1) a history of previous attacks of palpitation of sudden onset and sudden offset; (2) with a heart rate of about 180 per minute and regular; (3) the rate unaffected by held breath, swallowing, change

of position, rest or exercise; (4) the rate unaffected or suddenly terminated by vagal pressure; and (5) the minute count constant from minute to minute, then in all probability we have a case of paroxysmal tachycardia. The minute count is obtained by counting the heart rate with the stethoscope over the apex for a full minute and repeating in five to ten minutes. In paroxysmal auricular tachycardia the minute count should not vary more than one or two beats, one beat where the second hand crosses the line at the start and one beat on the last second of the minute.

In borderland hyperthyroid states we sometimes observe attacks of palpitation of sudden onset but the offset is gradual, the rates dropping from around 160 beats per minute to 130 beats per minute to 120 beats per minute and thus resuming the patient's usual rhythm. In true paroxysmal auricular tachycardia the rate jumps abruptly between two beats to 180 or 190 or whatever the rate may be, stays at that rate for the duration of the attack and as suddenly between two beats resumes the usual rhythm.

Auricular Flutter.—This irregularity has been defined as that condition in which the auricles, due to new impulse formation outside the sinus node, are beating regularly at rates, varying in different cases, from 200 to 350 beats per minute. Flutter bears some resemblance to paroxysmal auricular tachycardia, but whereas in tachycardia each auricular contraction is followed by a ventricular contraction, in the high rates of flutter it is impossible for the ventricles to respond to all the auricular impulses so that some degree of block occurs, usually a 2 to 1 ratio obtaining, which means that two auricular beats occur to each beat of the ventricles. This degree of block is not always constant, but may vary from 2 to 1, to 3 to 1, or even 4 to 1 block. At times these ratios change from one rhythm to another, giving the heart an irregular action which might cause the condition to be confused with auricular fibrillation. However, this need not cause much trouble since in flutter there are always periods of regular rhythm, which rarely obtains in fibrillation.

Usually when flutter is first seen and especially should the attack come on in a paroxysm, the degree of block is a 2 to 1 ratio.

Certain fundamental points should be in mind when considering the possible presence of flutter,

namely, that while auricular tachycardia is relatively common and may occur all through life, flutter is a rare disturbance occurring in the middle and later years of life and is associated with signs of serious myocardial damage.

These patients with flutter usually give a history of previous attacks of palpitation of sudden onset for months or years, the present attack persisting. Examination reveals a regular ventricular rate between 130 and 160 beats per minute, which rate is unchanged by posture, rest, or exercise; is temporarily slowed by vagal pressure, but never stopped. The minute count is surprisingly constant from minute to minute.

Should there be any irregularity of the ventricular rate due to changing ratios of block, then a little exercise, namely, raising arm or leg from the bed, accelerates the ventricular action, induces perfect regularity of ventricular response (2 to 1 block) and then differentiation can readily be made. Should there still be any doubt clinically as to the presence of flutter then the total apex count is helpful.

Rates at the apex of 180 beats per minute or above must be auricular tachycardia, for to be flutter the auricles would have to be beating at least twice the counted rate or 360 beats per minute. This is so rare as to be negligible, the upper limits of auricular rate being as previously stated 350 beats per minute.

Finally, the termination of flutter is never sudden as in auricular tachycardia, but the condition is relieved by flutter merging into fibrillation and so back to the usual rhythm.

Auricular Fibrillation.—This is perhaps the commonest and most important of all the types of cardiac irregularity. It is marked by a disturbance in three of the fundamental functions of the conduction system, namely, impulse formation, irritability and conductivity.

The sinus-node, where normally stimulus matter regularly accumulates and is regularly discharged causing regular auricular contractions, has lost control, and from multiple areas over the auricular surface come rapid and minute twitchings and undulatory movements, but no definite systole of the auricle occurs, the auricles staying in diastolic standstill. These fibrillary twitchings of the auricular walls give rise to new pathologic impulses for contraction, similar to those shown to cause

single premature beats in extra-systolic irregularity. These numerous and haphazard impulses reach the A-V node, causing a profound disturbance in ventricular rhythm. The ventricular rate rises and contractions follow each other in a completely irregular manner. There occur short runs of small beats followed by large or small beats or by long or short pauses. This total lack of any dominant rhythm reminds one of the uneven gyrations of a freshly landed fish on the bottom of a boat.

The rate of ventricular response to these new stimuli depends on the soundness of the myocardium and the integrity of the conduction system. While the ventricles may, by excessive impulses, be stimulated up to 200 beats per minute, the usual rates in fibrillation, due to myocardial damage and conduction defects, lie between 90 and 140 beats per minute.

Many of the ventricular contractions have not sufficient force to open the aortic valves, so that these beats do not come through at the wrist, thereby producing a pulse deficit, namely, a difference in the number of beats counted over the apex of the heart with the stethoscope and the pulse rate at the wrist, the discrepancy often being 20 to 50 beats. For example, the rate at the apex might be 140 beats per minute while the rate at the wrist would total only 90 beats per minute.

While a pulse deficit does occur on other rapid rhythms, it is one of the suggestive differential points in auricular fibrillation. Due to the lack of auricular systole the ventricles are not completely filled, and this inadequate filling is further aggravated by the irregular diastolic pauses. Thus the systolic output of the heart is reduced and the flow and pressure in the coronary arteries is lessened, which latter further increases the myocardial debility.

The Murmur.—With fibrillation the presystolic rumble of mitral stenosis (the usual murmur) disappears, to be replaced by a long, low-pitched murmur beginning after the second sound. Because of the continual variation in the force of the heart there is variation in the intensity of the murmur, the murmur sometimes being absent because some of the beats are too weak to produce a murmur. While fibrillation, when once established, was formerly considered a permanent condition, now we have abundant clinical and instrumental proof that fibrillation may be of transitory nature, attacks

often coming on in a paroxysm, lasting a short time, followed by return to normal rhythm.

To summarize, the differential diagnosis is based on the following points:

1. A grossly irregular heart rhythm.
2. A heart rate moderately elevated from 90 to 140 beats per minute.
3. The presence of a pulse deficit is helpful but not pathognomonic.
4. The minute count varies at least three to five beats or even more per minute.
5. Vagal pressure slows the rate temporarily, but never stops fibrillation.
6. Change of posture accelerates the rate.

From the above points therefore it is generally not difficult clinically to differentiate fibrillation from auricular flutter and auricular tachycardia except where the heart rate is slow, namely, around 100 to 120 beats per minute. At these rates it may be confused with extra-systolic irregularity.

To differentiate these two we have only to remember that extra-systolic rates rarely rise above 120 beats per minute, that exercise reduces or abolishes extra-systoles, while it increases the irregularity and raises the rate in auricular fibrillation.

Before leaving this type of irregularity I wish to call attention to the association of fibrillation with goiter. This may be an accidental occurrence, since the fibrillation may have existed before goiter symptoms developed. But not infrequently fibrillation seems to develop as a result of the toxic action of the goiter and exists either as a continual state or occurring in transitory attacks preceding or following operation.

If the myocardium is healthy, relief of the goiter causes relief of the fibrillation in many instances.

Heart Block.—In this disturbance the conduction system is at fault. Impulses for contraction continue to be regularly formed as usual at the sinus node and regularly discharged at the normal rate. But after reaching the A-V node some or all of these impulses fail to be carried across the bridge of nervous tissue connecting auricles and ventricles, and there results *dropped beats*, *partial block*, or *complete block*, as the case may be.

The *dropped beat* is the first sign of incomplete conduction. When in a pulse previously regular

there is a long pause and one finds on listening to the heart that there is no sound nor movement during this pause (as occurs in extra-systole), nor any association with respiration as occurs in sinus arrhythmia, then the pause is probably due to a dropped beat from a failure of ventricular response.

As the degree of block increases, more and more beats fail to get across to the ventricle till finally the ventricle responds to only one-half the auricular beats and a 2 to 1 block is present. This is the usual type of partial block; while ratios of 3 to 1 and 4 to 1 do occur, they are uncommon. Suspect a 2 to 1 block when the ventricle beats regularly at rates between 40 and 50 beats per minute. If there is a sudden halving of the usual ventricular rate, suspect 2 to 1 block.

Complete Block.—In this condition *no* impulses get across to the ventricles and a complete dissociation occurs between auricles and ventricles. The auricles may beat as usual about 72 per minute, while the ventricle builds up a slow, regular, independent rhythm of its own at a rate of about 30 to 33 beats per minute. While not audible at normal rhythms sometimes the systole of the auricles can be heard during the long pauses of block as faint, muffled sounds. Also additional evidence of the contracting auricles can be seen by observing the regular rapid pulsations in the vessels of the neck.

Where heart block has become established some degree of ventricular hypertrophy is obligatory in order to obtain complete ventricular emptying. The diastolic blood pressure usually is low, due to the squeezing of the blood from the arteries into the veins during the long diastolic pauses. The systolic blood pressure is likely to be elevated to 160 to 200 mm. if the heart muscle is reasonably healthy to permit this adjustment.

Adams-Stokes' Syndrome.—In mild grades of block there often occurs giddiness, fainting or momentary loss of consciousness. These symptoms apparently may be caused by periods of temporary marked slowing of the ventricular rate, which may be reduced to a total of 20 beats per minute or even to 8 beats per minute. At times there may be single prolonged periods of from 3 to 15 seconds duration in which no ventricular systoles occur.

When either of the above conditions occurs, un-

consciousness supravenes, the patient's face and neck become livid, breathing becomes stertorous while twitching of the muscles of the face and upper limbs occur; but the tongue is not bitten nor urine voided. The above attack is called Adams-Stokes' syndrome. In apparent epileptic seizures with a ventricular rate constantly at about 30 beats per minute, one should always suspect heart block and Adams-Stokes' syndrome rather than epilepsy.

Alternation of Pulse.—This type of irregularity, characterized by a pulse regular in rate but uneven in force, and indicative of a myocardium overstressed nearly to the limit, is in the majority of instances impossible of recognition except by instrumental means. Rarely can the finger, palpating the pulse, detect the unevenness of alternate beats. If, however, the blood pressure cuff be applied and the radial pulse carefully palpated as the pressure in the armlet is increased, an alternation in the force of the beats, which was not appreciated before, becomes obvious as the smaller beats drop out and only the larger beats which are able to send an impulse to the wrist are detected.

There are no subjective sensations in this condition except those referable to the disease in which alternation occurs, namely, angina pectoris, senile hearts especially when associated with hypertension, and in some severe acute septic processes such as pericarditis and pneumonia.

In conclusion I wish to state that this endeavor at *clinical* recognition is in no sense an effort or desire to supplant such valuable aids as the electrocardiograph and polygraph, but disturbances of cardiac rhythm are often emergencies and sometimes serious, requiring immediate treatment when instruments may not be available.

Therefore, since, as has been shown above, the *clinical* recognition of many disturbances of cardiac rhythm is possible in the majority of instances, we should be prepared to differentiate these irregularities at the bedside or the operating table, leaving till later their exact verification.

Finally, I wish to acknowledge my indebtedness to the works of Doctors Thomas Lewis and John Hay, and to the writings of Doctors Samuel Levine, H. A. Willius and B. E. Hamilton, in the preparation of this paper.

TREATMENT OF THE CARDIAC ARRHYTHMIAS*

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We have seen from the preceding papers in this symposium that the frequently encountered irregularities of the heart-beat can be sharply defined and clearly recognized one from the other if all the agencies at our command are called upon in their investigation. As some of the arrhythmias are of the gravest significance and tax our therapeutic efforts to the utmost, while others are of little moment and do not require any special management, obviously, in the treatment of an irregular heart strict classification and correct interpretation are of the most fundamental importance. When these have been determined, the management of an arrhythmia is based on fairly well defined principles of treatment, the essentials of which only, of course, can be discussed here.

SINUS ARRHYTHMIA

This simple disturbance of rhythm need not detain us in a therapeutic discussion except to point out that its chief practical importance lies in its recognition in order that it may not be confused with one of the important irregularities. Depending on vagal tone, increased by deep breathing, and abolished by exercise, this type of arrhythmia obviously calls for no treatment. Unfortunately, though, it is not always correctly interpreted, and it is by no means uncommon to see children and young adults seriously cautioned against overdoing because of an "irregularity," when the rhythmical disturbance present is merely a heightened physiological response in a perfectly healthy heart.

EXTRA-SYSTOLES

Although frequently toxic or neurotic, the true cause of premature beats may often be in doubt, and the possibility of a damaged myocardium must always be kept in mind. For example, tobacco may in a given case be the exciting factor, but careful observation over a long period, together with electrocardiographic studies, may be necessary in order to determine whether the myocardial irritability is merely temporary and of little significance, or, on the other hand, is a permanent dis-

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ability indicative of grave cardiac impairment. Again, the age factor, together with the incidence of acute infections and other intoxications, should always be given considerable emphasis in weighing the importance of extra-systoles.

Extra-systoles may, therefore, be of minor significance, requiring only the removal of the exciting cause, or, on the contrary, they may represent a seriously crippled heart. Thus, the premature beat of the student undergoing his final examination requires only reassurance and the completion of the ordeal; whereas, extra-systoles in the arteriosclerotic man of affairs demand an easing of the load on an impaired myocardium, a strict curtailment of the patient's responsibilities and activities, a régime of properly balanced rest, diet and exercise, and the eradication of all possible foci of infection.

Drugs play little or no part in the management of extra-systoles, but occasionally mild sedatives, such as the bromides, by inducing more relaxation and rest, are of distinct value. Quinine and quinidin, through their depressing effect on the myocardium, may abolish a troublesome premature beat which intrudes itself unpleasantly on the patient's consciousness, but we must not allow these agents to lull us into a false security, nor postpone a searching analysis of probable causes and of the true state of the myocardium. It is hardly necessary to add that a heart exhibiting extra-systoles should not have its irritability increased by the administration of digitalis unless, of course, its use is necessitated by a failing compensation.

In spite of the occasional presence of serious myocardial damage, as in elderly individuals and in those carrying a hypertension, our attitude toward this common type of arrhythmia may well be a decidedly optimistic one, as fortunately the great majority of hearts showing extra-systoles are structurally intact. One so frequently sees men in their prime condemned to a constant worry, either from being told by their physician that the heart is irregular, or from being conscious themselves of the irregularity, when reassurance and removal of the cause are all that are necessary to abolish the extra-systoles. Let me illustrate by citing one of numerous similar examples: An important business man of fifty, who showed numerous extra-systoles during a period of great mental strain with attendant loss of sleep and heavy smoking, was refused life insurance. Fear of sudden death from

heart disease added to his troubles, and incidentally to his extra-systoles. A short trip abroad returned him thoroughly rested and absolutely free from the arrhythmia. Now over a period of four years his heart has maintained a perfectly normal rhythm, he has been accepted as an excellent risk by the insurance companies, and he is pursuing a life of great activity in which physical exercise and relaxation share their proper proportion with the day's work.

PAROXYSMAL TACHYCARDIA

There is unfortunately no uniform treatment for this remarkable phenomenon. A slight paroxysm may terminate suddenly following some simple procedure such as tipping the patient up, or some other abrupt change in posture. Induction of vomiting, friction of the chest wall, or pressure on the vagus, may likewise terminate an attack. As, however, rapid cessation is an outstanding feature of this disorder, cause and effect are often in doubt.

Severe, prolonged paroxysms may resist all efforts and tax our resources to the utmost. Hypodermics of morphine, strophanthin intravenously, digitalis by mouth in full doses, quinidin sulphate intravenously, and chloral by rectum, are amongst the many procedures resorted to, but from the very nature of the disturbance one must always anticipate that results from any of these measures will be uncertain.

The experience of different observers varies widely in the results obtained by treatment in paroxysmal tachycardia. Digitalis usually has no appreciable effect, but Bernstein has reported a paroxysm of fourteen and a half days' duration which responded to full digitalization after resisting all other forms of therapy. Price believes that strophanthin, 1/100 grain intravenously, is the most useful remedy. Quinine has a strong advocate in Wenkebach, but in two recent cases in which we gave it in large doses during the paroxysms there was no effect. My personal observation has been that hypodermics of morphine, together with, if necessary, chloral by rectum, offer the most relief, probably by placing the patient in the most favorable condition for a termination of the paroxysm.

Paroxysmal tachycardia is compatible with long life. Death during an attack is infrequent, although it may occur if the duration of the paroxysm is greatly prolonged. Unfortunately, we

have no means by which we may correctly forecast the frequency of recurrences. There may be only one attack or, on the other hand, there may be several paroxysms in the course of twenty-four hours. It is, as a rule, a recurring disturbance but the intervals between paroxysms are extremely variable.

Between attacks diligent search should be made for possible exciting causes. Any existing gastrointestinal disorder should especially receive attention.

AURICULAR FIBRILLATION AND FLUTTER

Both of these conditions require full digitalization. In fibrillation, digitalis must be pushed to a point where the excessive impulses coming through the auriculo-ventricular bundle are sufficiently blocked to enable the ventricles to rest. In flutter, full digitalization is sought in the hope of converting the rapid, regular auricular rate into fibrillation and thence to a normal rhythm.

The brilliant results obtained in auricular fibrillation by digitalis have given to this drug its unequaled pre-eminence in the therapy of cardiac disorders. If enough of it is given to saturate the fibrillating heart, digitalis blocks auriculo-ventricular conduction and secures adequate rest for the ventricles. Similarly, in auricular flutter if digitalis is administered in amounts sufficient to profoundly depress conduction, thereby increasing the heart block, fibrillation of the auricles may follow and may be succeeded by a normal rhythm.

In securing adequate digitalis dosage a great advance has been made by Eggleston, Robinson and others, by using the body weight as a guide, but Withering's original directions are still true that "it should be given until it either acts on the kidneys, the stomach, the pulse, or the bowels." Eggleston has suggested 0.15 gm. of the leaf, equivalent to 1.5 c.c. of the tincture, for every ten pounds of body weight. Thus, by this method a man weighing 150 pounds would require 22.5 c.c. of the tincture for full digitalization. The experience of many, however, is that 0.1 gm. of the leaf, equivalent to 1 c.c. of the tincture, is sufficient for every ten pounds of body weight. Thus, in the 150 pound man, where rapid digitalization is required, as in auricular fibrillation, my usual practice is to administer a total of 15 c.c., given as follows: one-half of the total amount at the first dose, one-fourth after six hours, one-eighth in six

more hours, and the remaining one-eighth at the end of another six hours. The method is perfectly safe, as after the initial dose, succeeding doses may at once be discontinued if saturation is shown by a marked reduction in ventricular rate, or by the electro-cardiogram, or by toxic symptoms or coupled beats.

It is, I have found, more true of digitalis than of almost any other drug that the great mistake made in its administration is in giving it in too small and therefore ineffective doses. The great value of large and sufficient dosage is that complete saturation of a fibrillating heart can be obtained within a few hours, thus securing adequate rest for the ventricles. Furthermore, after saturation has been reached it must be maintained. The rate of excretion of digitalis in the adult amounts to 0.1 to 0.2 gm. of the leaf daily, the equivalent of 1 to 2 c.c. or 15 to 30 minims of the tincture. Therefore, it is necessary to administer at least this amount every day in order to maintain saturation when once it has been properly secured. Too much emphasis cannot be laid on this point, as by this means a fibrillating, badly crippled heart may carry on with a fair degree of efficiency for years.

Not since its introduction by Withering over 100 years ago has any drug been found which can surpass, or even approach, digitalis in the treatment of auricular fibrillation. Great interest, however, has recently been taken in the possibilities which quinidin sulphate possesses of bringing about a return to normal sino-auricular rhythm in some cases of auricular fibrillation. Almost a thousand cases of auricular fibrillation treated with quinidin sulphate have been placed on record since Frey, in 1918, advocated its use and recommended it in preference to quinine, which had been introduced into the therapy of auricular fibrillation by Wenkebach in 1914. While some observers are most enthusiastic over the results obtained, others issue serious warnings against the use of quinidin. When Lewis and his co-workers in 1921 showed that quinidin lengthens the refractory period of the heart muscle and slows conduction time, MacKenzie pointed out that the danger from the drug would lie in emboli following sudden restoration of sino-auricular rhythm. The report by Orr of embolic infarction of the brain occurring when normal rhythm was restored in a case of flutter, and several other cases now on record of embol-

ism following the administration of quinidin, have emphasized the importance of MacKenzie's warning. In spite of this possible danger, the majority of observers are agreed that in selected cases of fibrillation the employment of quinidin is justifiable in an attempt to bring about a restoration of normal rhythm. Its indiscriminate use is most certainly to be deplored, and especially in cases of long-standing fibrillation, or in fibrillation associated with decompensation, I feel most strongly that we are not justified in taking the risk of a possible fatal embolus through its administration. On the other hand, in fibrillation of recent origin, preferably of less than six months' duration, and in paroxysmal fibrillation, provided that the cases are kept under strict observation, I believe we have in quinidin a drug of unquestionable value. Numerous reports attest its merits. Thus, in twenty cases of auricular fibrillation reported by Clark-Kennedy, seventeen returned to a normal rhythm under quinidin. In Hay's fifteen cases, fibrillation was arrested in seven. Hewlett and Sweeney secured a return to normal rhythm in four out of eleven cases. In Hamburger's eighteen cases a normal rhythm was established by quinidin in eleven. These and similar reports show that normal rhythm has been restored by quinidin in 50 per cent or more of the cases in which it has been used. Such encouraging results, therefore, have in a selected case to be carefully weighed in the light of the known untoward results which have occasionally followed the employment of this drug.

When, after careful consideration, a case has been selected for quinidin therapy it is always advisable to test the individual reaction to the drug by first giving two doses of 3 grains each, from two to four hours apart. If these test doses have been well tolerated, from 15 to 30 grains a day, in divided doses, may then be administered until the rhythm becomes regular or until toxic symptoms appear. My experience has been that in the successful cases response to the quinidin usually occurs early, and that if by the fifth day a normal rhythm has not been established it is advisable to discontinue the drug. When a normal rhythm has been secured it may remain regular without the further administration of quinidin, other cases will require daily doses of 3 to 6 grains to hold the rhythm regular, while still others return to fibrillation in spite of the continuance of the drug.

Finally, in the management of these serious ar-

rhythmias, general measures, such as rest in bed, regulation of diet and restriction of fluid intake, are now procedures of such recognized value that they no longer need be emphasized.

HEART BLOCK

As arteriosclerosis plays such an important part in the production of bundle lesions, the treatment of most cases of auriculo-ventricular, branch, and intra-ventricular block is chiefly a question of rest and the enforcement of all protective measures which will relieve the crippled heart and arteries of unnecessary strain. Where, however, the existence of syphilis can be established, or in any case where there is the slightest chance of syphilis being a factor in the block, vigorous inunctions of mercury with large doses of the iodides should be pushed to the limit of tolerance. Under these measures a block may be abolished by the clearing up of a gumma or syphilitic infiltration in the bundle. Unfortunately, however, the outcome from such treatment is by no means certain and many cases which we have every reason to believe are due to syphilis fail to respond to even the most active treatment. Neosalvarsan in the syphilitic heart should, I feel, always be used with caution. Chief dependence should rest upon mercury and the iodides, but in a favorable case a small test dose of neosalvarsan may be administered and if unattended by any ill-effect may then be followed at intervals by other small doses. In cases of partial auriculo-ventricular block, especially where digitalis is suspected as a factor, atropin, by releasing the tonic action of the vagus, may be of decided value.

PULSUS ALTERNANS

The temporary alternation in the volume of the pulse occasionally seen in rapidly beating hearts, as in paroxysmal tachycardia and auricular flutter, is usually of slight significance. When, however, the contractile power of the ventricles has been so exhausted by myocardial degeneration that a persistent pulsus alternans is the result, the outlook is extremely grave and our chief concern must be to protect and relieve the heart in every way possible. Rest is the main essential in treatment. By lessening the exhaustion of the heart and relieving it from all strain, rest may sometimes restore a considerable degree of contractility even to a badly degenerated myocardium. Therefore, all measures to secure this end, including the free use of sedatives, must be sought.

In conclusion, let me emphasize again that a correct interpretation of its cause and significance constitutes the main platform upon which the treatment of an irregular heart is to be built; and that, although in some of the cardiac arrhythmias our therapeutic efforts are limited, there are others in which active measures of treatment, if carried out with sufficient thoroughness, lead to extremely satisfactory and even brilliant results.

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EPSOM SALT PROTECTS AGAINST MOTHS

Epsom salt sprinkled in trunks, cupboards and other closed spaces is a great protection against moths, cockroaches and vermin and is considered preferable to the commonly used naphthalene by Dr. Paul Mitchell, Australian quarantine officer, whose recent investigations are told to us in the September *Hygeia*, popular health magazine (Chicago).

Dr. Mitchell noticed that on opening passengers' baggage for fumigation magnesium sulphate (Epsom salt) was sometimes used by travelers for the prevention of vermin. He determined to test its value as contrasted with naphthalene in the linen cupboards of the quarantine station, which was considerably troubled by the presence of moths, cockroaches, silver fish and a species of ant.

The cupboards were carefully cleaned out, the linen replaced and magnesium sulphate crystals scattered over the linen and shelves in one block, while naphthalene was used in another block. Weekly observations were made. At the end of three months traces of vermin were found in the cupboards where naphthalene was used, while those sprinkled with Epsom salt were free and the crystals of the salt as crisp as ever.

The difference in favor of magnesium sulphate was more noticeable at the end of five months, and by the end of a year the cupboards were still quite free from vermin, although the magnesium sulphate had deteriorated slightly, about a third of the crystals having turned to powder. These observations were confirmed by other trials. When tried in the open wards of the hospital, however, on mattresses, for example, the magnesium sulphate was found to deteriorate to a powder.

Dr. Mitchell concludes that Epsom salt is of far greater efficiency than naphthalene for the protection of linen and other fabrics against moths, cockroaches, silver fish, etc., but that on account of its rapid deterioration in the open it can only be employed in closed spaces.

STIGMAS OF LATE CONGENITAL SYPHILIS

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My remarks will be limited to the characteristic changes in the structure of the body, which, when taken alone, warrant a diagnosis of syphilis, or should arouse suspicion leading to a diagnosis, irrespective of serology or history. Lawrence, in a statistical summary of the congenitally syphilitic children seen in New York State (exclusive of New York City) has called attention to the frequency with which these stigmas are overlooked, and confirmed the impression that the majority of the diagnoses are made because of the suspicion aroused by a history of parental infection or by the positive Wassermann report on parent or child.

The signs and symptoms which will be enumerated are those seen particularly in the child or adult who has passed through the early stages of syphilis acquired in utero, and who has managed to survive the acute phase of the infection. Such children may have had the "snuffles," or they may have had active cutaneous syphilis shortly after birth; but due either to their resistance or the low virulence of the invading organism, they have managed to survive this period, and may have reached puberty or adolescence before noting any serious effects from the infection. Many of these signs and symptoms are not manifested until later in life, when some accident, such as severe trauma, or a complication, such as pregnancy, or a superimposed infection, such as influenza, typhoid fever, pneumonia, or the exanthemas, lights up the latent syphilis. Fournier found that the average age at which the first subjective symptoms of late congenital syphilis appeared was twelve years, the ages ranging from three to twenty-eight years.

A discussion as to the mode of infection will be omitted, also as to whether the infection is paternal or maternal, whether the syphilis is acquired in the birth canal, and whether the spirochete itself, or some period in the life cycle of the spirochete, is the cause of the latency. It should be emphasized that in this series of cases 30 per cent of the patients had negative reactions prior to receiving treatment, and 60 per cent became Wassermann negative under treatment. More than half of the 30 per cent

showed clinical evidence of active syphilis in spite of the negative Wassermann reaction.

THE HUTCHINSON'S TRIAD

Perhaps the best known evidence of inherited syphilis is in the so-called Hutchinson's triad, the symptoms being eighth nerve deafness, interstitial keratitis, and Hutchinson's teeth. This triad was described by Hutchinson in 1863, and the symptoms are definitely pathognomonic. In various reports it is estimated that only 8 per cent of congenitally syphilitic children have the three manifestations, although a combination of either two, or one alone is often seen.

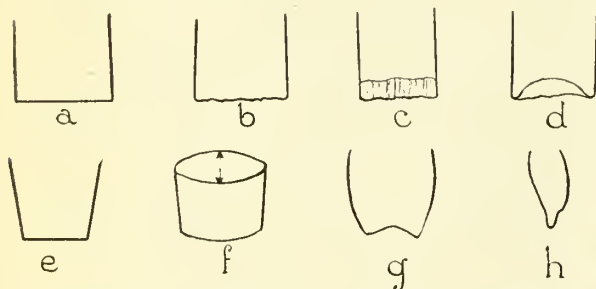


Fig. 1. a—Normal tooth, b, c, d—non-syphilitic serrations and notchings, e—Hutchinsonian incisor, converging edges (screw-driver shape), f—the Hutchinsonian incisor is a truncated cone, g—Typical Hutchinsonian tooth, pegged and notched, h—sagittal section showing anteroposterior thickening and notching.

Eighth nerve deafness.—Gradually increasing deafness in a young patient who has no local disease of the ear should arouse a suspicion of syphilis. The eighth nerve is one of the first to show clinical evidence of a syphilitic involvement, and it should be borne in mind that not only is the nerve itself the site of the reaction process, but that more frequently the appearance of the deafness means an active neurosyphilis with secondary eighth nerve involvement. The meninges are involved first, then the eighth nerve, and finally the labyrinth. Eighth nerve deafness may also be secondary to periostitis of the auditory osseus system. The number of congenitally syphilitic children examined who are deaf, varies, according to different observers, from 5 to 30 per cent. The deafness may appear early in life or not until maturity or puberty; it usually begins at the age of fourteen years, although cases have been reported at the age of forty-four years.

The onset may be gradual, with associated tinnitus, dizziness, and vertigo. Some consider a lowered bone conduction with a loss of the high tones of diagnostic value, although Goeckerman and

Barlow have shown that its value is questionable because 49 per cent of non-syphilitic patients examined had a definite reduction. If deafness develops late in life, labyrinthitis is commonly associated. Eighth nerve deafness may be the only involvement manifested in a family of congenitally syphilitic children.

The prognosis as the result of treatment is not very favorable unless treatment is started while the process is acute. Occasionally, in disease of this type the advance will be arrested and result in impaired hearing rather than in total deafness.

Interstitial or parenchymatous keratitis.—Interstitial or parenchymatous keratitis, which is seen in from 20 to 30 per cent of syphilitic children, is also an associated condition in from 2 to 10 per cent of patients with acquired syphilis. Zimmermann noted that interstitial keratitis was a symptom in 33 per cent of white male children, in 61 per cent of white female children, in 35 per cent of colored male children, and in 75 per cent of colored female children, with congenital syphilis,



Fig. 2. Typical Hutchinsonian upper central incisors.

although other reports vary from 6.5 to 96 per cent. Greene observed that nineteen of 100 patients had evidence of past interstitial keratitis. That girls

are more likely to have keratitis has been pointed out by several authors, and de Schweinitz mentioned the association of the onset of keratitis with menstruation. The onset, usually between the fifth and fifteenth year, is insidious, with ciliary congestion, photophobia, lachrymation, pain, and the appearance of a cloudy patch within the center of the cornea. Iritis, choroiditis, and retinitis may be associated. The two latter conditions are similar to those associated with acquired syphilis. Blood vessels derived from the ciliary vessels appear in the layers of the cornea, and produce the dull red color, or so-called salmon patch of Hutchinson. The presence of the minute straight blood vessels in the corneal scar, and the deposits in the retina and choroid after the acute process has subsided, may be a means of recognizing the inherited syphilis as the etiologic factor.



Fig. 3. Pseudo Hutchinsonian teeth. Examples of notching (traumatic) in a congenital syphilitic whose teeth are not of the true Hutchinsonian type.

The appearance of interstitial keratitis should be a warning that eighth nerve deafness may occur if vigorous antisyphilitic treatment is not given. The differential diagnoses of syphilitic interstitial keratitis and other types are based largely on the rec-

ognition of the associated stigmas and other clinical evidence.

Optic neuritis, optic atrophy, and extra-ocular paralysis are seen in association with congenital neurosyphilis, and present a picture similar to that

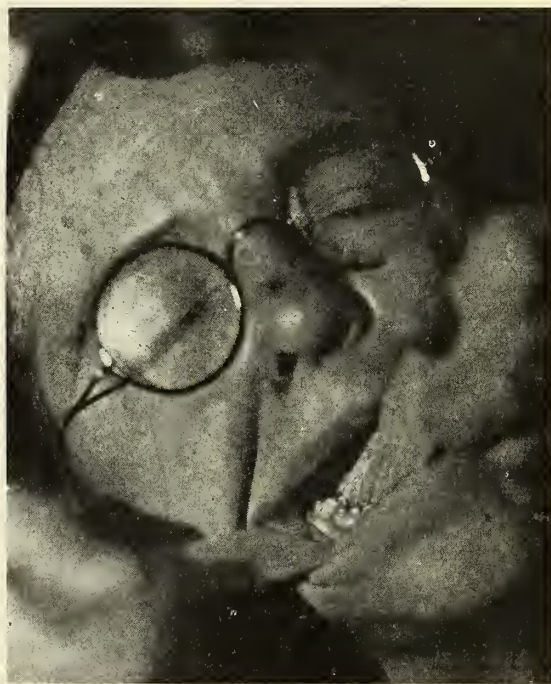


Fig. 4. Mulberry molar.

seen in acquired syphilis. Solomon quotes various statistics to show that between 0.4 and 0.63 per cent of all patients between the ages of eight and fifteen years with diseases of the eye have interstitial keratitis. Bilateral dacryocystitis may often be attributable to congenital syphilis.

Hutchinson's teeth.—These are one of the most valuable single diagnostic signs. The changes noted are in the permanent teeth only. According to various statistics, between 10 and 48 per cent of syphilitic children have one or more such teeth. The typical Hutchinson's tooth is peg or "screw-driver" shaped (Fig. 1, e), it is thickened anteroposteriorly (Fig. 1, f and h), is notched or grooved (Fig. 1, g), and the teeth are widely spaced. These characteristics are named in the order of their importance. The pointed tooth is not diagnostic unless among the upper central incisors (Fig. 2). The anteroposterior thickening is demonstrated in (Fig. 1, f and h). The grooving or notching is by no means as valuable a diagnostic aid as either of the two characteristics just described, but unfor-

tunately is the one so diligently searched for by those seeking to make a diagnosis of congenital syphilis. The most common change in the cutting surface of the tooth is the upward arching or grooving, the degree being dependent on the degree of pegging and anteroposterior thickening (Fig. 1, g). In other words, the more narrow the tooth, the more acute the arch or the grooving. The serrations and grooving noted in Figure 3 and Figure 1, b, c, d, may be seen in children who do not have syphilis, as well as in the congenitally syphilitic child. The spacing between the upper and lower central incisors is an additional diagnostic aid when associated with the other three characteristics. Single Hutchinsonian teeth are not uncommon, and may be of material aid in the diagnosis. Alapasia of the teeth, and particularly absence of the incisor teeth, should arouse suspicion. Stokes and Gardner have called attention to the value of x-ray examination of the teeth of children in whom the eruption of the permanent incisors is delayed. They demonstrated the unerupted Hutchinsonian tooth in a child who had been under anti-syphilitic treatment for four years before the x-ray examination was made.

Various other abnormalities in the incisors are seen occasionally, such as dwarfed or pointed lateral incisors, and loss of enamel on the lower third of the tooth, but these have no diagnostic value unless found in association with other clinical signs of the disease.

Besides the characteristic changes in the upper central incisors, sixth year molars may show similar changes. Attention was called to these teeth in 1870 by Moon, of England, and recently by Wall, of this country. The cutting surface of the tooth is worn, pitted and excavated. In this country it is called the mulberry or honey-combed molar, and is as common as the Hutchinsonian incisor (Fig. 4). An extra cusp, or the tubercle of Carabelli, on the inner side of the sixth year molars has been emphasized repeatedly by Sabouraud. In our experience it has been found not only in syphilitic children, but also in many normal healthy persons.

CUTANEOUS AND OTHER MANIFESTATIONS

The solitary gumma and the nodular syphiloderma.—The most common cutaneous manifestation of late congenital syphilis is the solitary gumma, and the typical nodular or tubercular syphiloderma, noted so often in patients with acquired syphilis,

may be seen occasionally in the congenitally syphilitic patient. The cutaneous gumma is usually the result of the extension of any underlying syphilitic process to the skin, but may be a solitary cutaneous involvement. The nodular syphiloderma with its characteristic, indurated, arciform border, and a tendency to peripheral extension, residual pigmentation, and atrophic scarring, is identical with the late syphiloderma of acquired syphilis. The so-called copper colored spots, supposedly the residue of an active syphilid, are of little diagnostic aid because, as a rule, such spots are not a result of syphilis.



Fig. 5. Classical facies of lues hereditaria tarda.

Scarring.—The scarring noted at the mucocutaneous junctures, known as rhagades, are valuable adjuncts. They are to be found most often about the mouth, eye, anus, and nares. The "spoke-like" character of the scarring is one of its salient points.

Lesions of the mucous membrane.—The lesions of the mucous membrane are of two types: the acute infectious mucous patch, and the late nodular gummatous ulceration. The former is seen in

the very young patient; the latter may be noted at any period of the disease. Syphilitic leukoplakia is rarely seen in these patients.

Visceral involvement.—The visceral involvement does not differ essentially from that of acquired syphilis, except in its insidious onset and slow progression. Hepatic syphilis, with which 14 per cent of our patients were affected, is the most common visceral complication, and cardiac syphilis among the rarest.

Facies.—Not all congenitally syphilitic children present the classical textbook facies characteristic of congenital syphilis, but when they exist, they are usually recognized at sight. In fact, there is an erroneous tendency to attribute to syphilis all conditions that cause a "saddle-back nose," the paramount change in the congenital syphilitic facies. The characteristics of the pronounced facies seen in Figure 5 are due to the destruction of the septum, the prominence of the frontal bosses, the high forehead or so-called Websterian dome. The prominence of the lips and peg-shaped head are also contributory. When the nasal septum is intact there may be either no deformity or only a slight depression of the nasal bridge. In this type the forehead and prominent frontal bosses are sufficient to stimulate one to search further for other stigmas.

Lesions of the bones.—The lesions of the bones in congenital syphilis are valuable aids in its diagnosis. The most common lesions noted are saber-shin, periostitis, osteochondritis (epiphysitis), dactylitis, osteitis, and lesions of the joints.

The so-called saber-shin, or the anterior bowing and lateral thickening of the tibia, is a valuable sign (Fig. 6). The underlying process, which may be either a bone blister or a subperiosteal gumma that has become calcified, is, as a rule, symptomless, although occasionally an acute process may light up with symptoms of pain, particularly at night, swelling, heat, and marked tenderness. The distinction between the anterior bowed tibia of syphilis and the lateral bowed leg of rachitis must be borne in mind. The former is associated with definite lateral thickening of the tibia besides other evidence of syphilis, while the latter is associated with lesions of the tibia and fibula, and clinical evidence of rickets.

Congenital syphilitic periostitis, when acute, presents essentially the same findings as acquired

syphilitic periostitis: pain, tenderness, swelling, and nocturnal pain, but in the chronic type, thickening and bowing are the only signs, the roughening of the anterior edges of this tibia not having much diagnostic value.



Fig. 6. Saber tibia.

Osteochondritis or epiphyseal enlargement is a common complication. When it occurs in the wrist it is the cause of ulnar deviation or the spreading of the fingers to the ulnar side when fully extended. Enlargement of the elbow and knee-joints may be noted also.

Dactylitis, the fusiform swelling of the shaft of the phalanges, may be noted in syphilitic and tuberculous children. The pathologic process, according to the x-ray, may be either osteitis or osteomyelitis. Syphilitic dactylitis is usually single, most often involving the index finger, while tuberculous dactylitis is invariably multiple.

Osteitis and osteomyelitis, with or without associated periostitis, present no particular characteristics, and other stigmas of the disease must often be sought before the causative factor can be determined.

Hydroarthritis, or glutton's joints,^{4, 5} is a painless bilater hydrops due to inflammation of the synovial membrane, involving as a rule only the knee-joints. The von Gies joint, or osteoarthritis, is a progressive multiple chondritis occasionally encountered in the syphilitic child.

Graves called attention to the scaphoid or winged scapula, in which there is a convex curvature of

the vertebral side of the angle. Syphilitic Pott's disease has also been observed not infrequently.

Lesions of the nervous system.—The nervous system is involved in much the same way as in acquired syphilis. The more common forms of neurosyphilis are epilepsy, tabes dorsalis, paresis, taboparesis, paraplegia, diplegia, hydrocephalus, and cerebrospinal sclerosis. Parker, in a report of seven cases of juvenile tabes, noted that the clinical findings were quite similar to those recorded in cases of the acquired type of neurosyphilis, differing, however, in the insidious onset and latent course of the disease, the frequency of incontinence, and optic atrophy. He observed that ataxia, girdle pains and lightning pains were very rare.

In this group of late congenitally syphilitic children only 14 per cent had definitely positive spinal fluid findings, whereas Jeans has reported 32.7 per cent, and Kingery 28.8 per cent. The difference may be attributable to the fact that in my series, the borderline or questionably positive spinal fluid findings were not regarded as positive. The average age of onset of clinical symptoms of congenital neurosyphilis is about fifteen years. Hydrocephalus, paraplegia, and diplegia due to syphilis are rare. Mental retardation and idioey are often met with as complications. Higgins reports that 42 per cent of mentally defective children had positive Wassermann reactions, and Jeans found that twelve of twenty-five neurosyphilitic children were mentally defective. In spite of these figures we frequently see the congenitally syphilitic child who is decidedly precocious and above his age average mentality. Hypertrichosis in the brunette, and the "syphilitic mop" are contributory findings. Leontiasis ossei, chronic peritonitis, intestinal bands and kinks, pulmonary lesions, nephritis, both acute and chronic, Raynaud's syndrome, Banti's disease, and aleukemic lymphadenosis have all been reported by various writers as attributable to congenital syphilis.

CONCLUSIONS

1. The classical stigmas of congenital syphilis are described, Hutchinson's triad being the most prominent.

2. Statistics are given as to the frequency with which certain of the stigmas are found. However, any deduction drawn from the percentages given would be misleading because it is not uncommon to find but one diagnostic stigma in a congenitally syphilitic child.

3. The serologic findings in this group have been particularly emphasized in order to impress on the reader the fact that, if only the Wassermann test of the blood is depended on for the diagnosis, only 70 per cent of the cases of late congenital syphilis will be correctly diagnosed.

4. Neurosyphilis was revealed in only 14 per cent of the children examined serologically, in contrast to 32.7 and 28.8 per cent as reported in the literature.

5. Attention is called to the need of corroborative aids, such as examinations of the eye and ear, x-ray examinations, and serologic tests in certain of these patients.

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INTRAPERITONEAL TRANSFUSION WITH CITRATED BLOOD: A FURTHER CLINICAL STUDY*

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INTRODUCTION

The therapeutic benefits to be derived from blood transfusions are well recognized. The introduction of sodium citrate solution, with the consequent development of our present-day technique, has made transfusion a fairly common and relatively simple procedure. Until recently the importance of blood transfusions in infancy has not been fully appreciated. The introduction of the sinus route by Helmholz in this country, opened a new field in pediatric therapeutics.

However, an important period of life, during which the anterior fontanelle is closed and direct exposure of a vein difficult or impossible, was overlooked. Furthermore, while sinus puncture to the trained and well equipped man is a relatively simple procedure, it is not without inherent dangers. Many men have pointed out the difficulties frequently encountered, due to anatomical variations, to previous trauma, or to technical considerations of the moment. Under these conditions, and especially during the first period of childhood, a method of transfusing blood became essential.

Direct intravenous transfusion is obviously impractical, except through the jugular vein. The introduction of blood through the jugular vein is, however, limited in its scope to a comparatively few men of sufficient experience and training. Individual aptitude for any special technical procedure cannot apply to the profession at large.

The only other route that affords any possibility of success is the intraperitoneal one.

REVIEW OF PREVIOUS DATA

a. Animal Experimentation.

Since the work of Von Recklinghausen, in 1862, numerous investigators have shown that the peritoneal cavity of animals is capable of marked absorptive powers. All of the work was done with whole blood or defibrinated blood. Ponfick, in 1875; Poncet, in 1879; Arloing and Tripier, in

1880; Hayem, in 1884; Wm. Hunter, in 1887; Southgate, in 1897; Lesage, in 1900; Buxton and Torrey, in 1906; and Zimmerman in 1921,[†] are among the outstanding observers who have carried on investigations in this field. These men showed, through various more or less ingenious methods, that blood is absorbed from the abdominal cavity.

In a previous communication, Siperstein and Sansby² have shown the value of using citrated blood. From a study of a fairly extensive, controlled series of experiments, we were able to show that freshly citrated blood is absorbed very rapidly from the peritoneal cavity of rabbits. We concluded from our study on animals that the intraperitoneal route for blood transfusions was a justifiable procedure, safe in application, practical in results, and deserved a clinical trial.

b. Clinical Experimentation.

As far as we have been able to determine, Ponfick, in 1875, was the first one to inject defibrinated blood into patients. His results were apparently favorable. Buresi, Golgi and Raggi, Scottini, Giovanni, Liegl, and others, used this method, about the same time, without striking effect. The intraperitoneal injection of defibrinated blood then fell into disuse.

Our own studies, however, with citrated blood encouraged us to attempt its clinical application. Complete data and results obtained have been published elsewhere³. It may be stated, in brief, that we felt justified, from the therapeutic effects obtained, in continuing this procedure in other cases.

MATERIAL AND METHODS

It is our purpose in this paper to discuss intraperitoneal blood injections in general and to present other clinical cases. Furthermore, we are able to report several cases showing the limitations of this method.

Our clinical diagnoses in the cases to be presented are:

- Case 5. Secondary anemia. Hemolytic anemia.
- Case 6. Purpura hemorrhagica.
- Case 7. Athrepsia.
- Case 8. Streptococcic meningitis.
- Case 9. Pyloric stenosis.
- Case 10. Prematurity. Lues.

A routine method of procedure is followed. The recipients' and donors' bloods are grouped before

*From the Department of Pediatrics, University of Minnesota. Read before the Consulting Medical Staff of the Lymanhurst School for Tuberculous Children, Jan. 23, 1923.

[†]A complete review of available literature was given in a former paper.

every transfusion. The usual precautions regarding the donors' blood are always taken.

On the morning of the transfusion the patient is not given any breakfast. Freshly prepared 2 per cent citrate solution is used in the customary proportion of 10 c.c. of citrate solution to 100 c.c. of blood. The donor's blood, kept at body temperature and strained through gauze, is *immediately* injected into the peritoneal cavity of the patient. The abdominal puncture is performed in the usual manner.

It is necessary to emphasize only two points in the entire procedure. The citrate solution must be fresh and the donor's blood must be injected immediately.

For forty-eight hours following each transfusion all specimens of urine and feces are tested for blood. Benzidine and guaiac tests are used. In addition, the temperature of the patient is taken every two hours until the reaction, if any, has subsided (Figs. I and II). Hemoglobin estimations, red blood cell counts and blood smears are in some instances taken every hour on the day of transfusion, then at least once daily during the subsequent stay in the hospital. Unless otherwise stated, all hemoglobin determinations are made with the Fleischl-Miescher hemoglobinometer. All the blood counts are made by the same person, ruling out individual variations in technique.

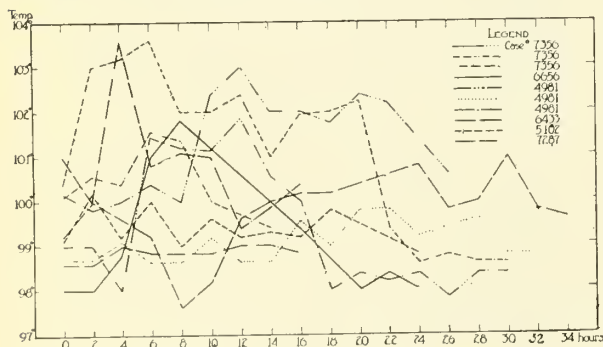


Fig. 1. Graphic presentation showing temperature reactions following intraperitoneal transfusions.

CASE REPORTS

CASE 5. (H7356)—Secondary Anemia (?) Hemolytic anemia. Patient, five months old, admitted to the hospital Dec. 11, 1922, complaining of pallor, listlessness and poor appetite. When two weeks old, the baby suddenly "turned yellow" and commenced to vomit. A doctor was called, who found a marked secondary anemia (hemoglobin 20 per cent; red blood cells 1,472,000). The baby was given whole blood subcutaneously several times without marked effect. The sinus route was then resorted to with

better result. A third attempt at sinus transfusion was unsuccessful. Direct exposure of a vein in the arm was also unsuccessful. The baby was then given citrated blood intraperitoneally a number of times with apparent success. The transfusions were discontinued when the hemoglobin reached 59 per cent.* Two weeks after the last transfusion, the hemoglobin began to fall. Medical advice was not requested until December 9, 1922. At that time, the hemoglobin was 28 per cent.

Physical examination showed a well developed, well nourished infant, apathetic, irritable, with a marked pallor and slightly yellow tinge to skin. The spleen was palpable 6 cm. below the costal margin.

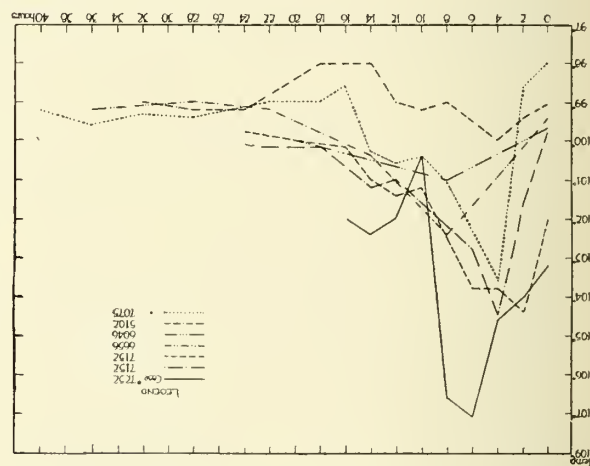


Fig. 2. Graphic presentation of temperature reactions following intravenous transfusions.

Laboratory Data on Entrance.—The urine examination was negative and there was no urobilin or urobilinogen present. The stools were repeatedly negative for blood. The blood picture showed a hemoglobin of 35 per cent (Von Fleischl-Miescher); red blood cells 1,300,000; white blood cells 31,200 with a differential count of polymorphonuclears, 24 per cent; lymphocytes, 88 per cent; transitionals, 6 per cent; and eosinophiles, 2 per cent. The Wassermann reaction was negative. The parent's blood test was also negative. The bleeding and clotting time was within normal limits. The fragility test was normal. The patient was in Group IV. Morphological examination showed deeply stained red cells; marked anisocytosis, many nucleated erythrocytes; polychromatophilia—evidence of active bone marrow stimulation.

Subsequent Notes.—Dec. 11, 1922. Intraperitoneal transfusion with 100 c.c. of citrated blood. Temperature reaction—103 degrees. (Fig. 1.) No occult blood in urine or feces.

Dec. 13, 1922. Intraperitoneal transfusion with 100 c.c. of citrated blood. Slight temperature reaction. Gradual improvement in blood picture.

Dec. 15, 1922. Color of skin and general condition is improved. No urobilin or urobilinogen in the urine.

Dec. 18, 1922. Intraperitoneal transfusion with 100 c.c. of citrated blood. Blood picture apparently normal mor-

*This case was reported in detail in a previous communication.

phologically. No change in size of spleen. Urine and feces negative for blood.

Dec. 29, 1922. General improvement with gain in weight. Spleen barely palpable. Duodenal contents shows no urobilinogen and 2,816 degrees urobilin.

Jan. 2, 1923. Duodenal contents shows no urobilinogen and 1,720 degrees urobilin.

Jan. 7, 1923. The blood picture has remained fairly uniform since the last transfusion. There has been a steady gain in weight.

Jan. 11, 1923. Blood values have dropped the past few days. The hemoglobin is 63 per cent; the red blood cells—3,450,000.

Jan. 12, 1923. Intraperitoneal transfusion of 150 c.c. citrated blood. Donor and recipient were cross-grouped. No occult blood in urine.

Jan. 15, 1923. Physical examination shows patient in good condition. Spleen palpable 3 cm. below costal margin.

Jan. 29, 1923. Dispensary note: Examination negative. Patient is active and contented. Weight 6,950 grams.

Subsequent course and treatment are given in Table III, and in an earlier communication.

Dr. H. S. Lippman was requested to examine the blood smears of this patient. As a result of his study, he allows me to present the data obtained by him. (Table I.)

The following summary has also been prepared by Dr. Lippman:

"Throughout the case the bone-marrow is reacting well as evidenced by large groups of platelets, slight leucocytosis, and red cells which appear when bone-marrow is stimulated, anisocytosis, polychromatophilia, and nucleated red cells. Naked erythrocytic nuclei are also present in the first few smears and these are definite evidence of bone-marrow hyperactivity.

"The lymphatic hemopoietic tissue also shows evidence of increased stimulation by the plasma cells, Rieder cells, and increased number of lymphocytes."

Blood transfusion was urgent in this case. Evidently the efforts of the bone-marrow to regenerate a sufficient supply of cells could not cope with the apparent destructive process taking place simultaneously. Every method of giving blood had already been used. After the present admission into the hospital, three intraperitoneal transfusions at short intervals were sufficient apparently to restore the blood picture to normal (Table II). The rapid improvement of the general condition and of the blood picture in particular were very gratifying. It is interesting to note that this patient has received over 1300 c.c. of blood intraperitoneally. What is the fate of the injected blood? Any theory other than that of absorption is difficult to interpret. The rise in blood values and the clinical effect on the patient are indicative. The disappearance of evidence of bone-marrow stimulation following the transfusions also points to absorption of the cells. It has been shown that the bone-marrow ceases to function when the body possesses too much blood, for example in animals made plethoric by transfusions⁴.

CASE 6 (H6653).—Purpura hemorrhagica.

History.—A boy, three years of age, was admitted to the hospital Nov. 9, 1922, complaining of bleeding from the right eye and ear, nose and throat and small "bluish spots"

TABLE I
Comparative Data Showing Differential Blood Counts and Morphological Changes
(Dr. H. S. Lippman)

Date	Hgb. %	R.B.C.	W.B.C.	P.M.N.	Lymph.	Nucleated R.B.C.	Remarks
Dec. 11, 1922	35.0	1.3	31,200	40.5	49.0	9 per 100 W. B. cells	Occasional Rieder and plasma cell. Good bone marrow reaction.
Dec. 15, 1922	54.6	2.8	16,400	44.0	47.5	8 per 100 W. B. cells	Good rise in hemoglobin and erythrocytes. Less evidence of lymph-node irritation.
Dec. 18, 1922	54.6	3.2	11,500	24.5	71.0	12 per 100 W. B. cells	Bone-marrow reaction continues. Rise in lymphocytes probably relative.
Dec. 20, 1922	59.5	4.25	10,600	26.0	68.5	.....	3 plasma cells.
Dec. 23, 1922	70.0	4.24	.....	36.5	59.0	½ per 100 W. B. cells	Practically no nucleated red cells. Slight anisocytosis. Red cells almost normal.
Dec. 30, 1922	66.5	3.84	14,400	26.0	67.0	½ per 100 W. B. cells	No change.
Jan. 4, 1923	70.0	4.09	13,000	36.0	55.0	0 per 100 W. B. cells	Normal smear.
Jan. 10, 1923	66.0	3.97	12,600	24.0	70.0	0 per 100 W. B. cells	Normal smear.

over entire body. The mother had noticed blue spots all over the child's body on November 8, 1922. On the day of admission the patient began to bleed from the right eye and ear. There was also an active hemorrhage from the nose and mouth.

Physical examination showed a well developed, well nourished, very listless patient with purpuric spots over entire body and blood oozing from the eye, ear, nose and throat.

There was active bleeding from the mucous membrane of the throat. The heart showed a systolic murmur at apex and base, which was not transmitted. The spleen was not palpable.

Laboratory Data on Entrance.—The urine showed a trace of albumen, numerous hyaline, granular, and waxy casts and many red blood cells and pus cells. The blood examination showed a hemoglobin of 65 per cent (Tallquist); red blood cells, 3,900,000; white blood cells, 10,200—with a normal differential count. The platelet count was 35,000.

The patient was in Group III. The bleeding time was over three hours; the clotting time 30 min. (?).

Subsequent Notes.—November 9, 1922. Within two hours after admission to the ward the patient received 200 c.c. of citrated blood (Group IV) intravenously. The median basilic vein was exposed and transfusion performed. Immediately following the transfusion, the routine post-operative procedures were put into effect.

Nov. 10, 1922. Patient showed a slight temperature reaction, 102.2 degrees. Active hemorrhage started again at 2:30 A. M. and at 9:00 A. M. the pulse was barely perceptible. The median basilic vein of the other arm was exposed and 450 c.c. of citrated blood was introduced. Moderate hemorrhage followed the second transfusion. Bleeding stopped completely several hours later.

Nov. 11, 1922. No hemorrhage. Much improved.

Nov. 15, 1922. Intraperitoneal transfusion with 70 c.c. citrated blood. All specimens of feces were negative with

TABLE II
Comparative Data Regarding Hemoglobin and Erythrocyte Counts (Case No. 5)

Date	Time	Blood counts Hgb. %	R.B.C.	Remarks
Dec. 11, 1922	4:30 P. M.	35.0	1,310,000	Intraperitoneal transfusion with 100 c.c. citrated blood (mother donor)
Dec. 12, 1922	10:00 A. M.	38.0	1,520,000	
.....	3:00 P. M.	35.0	1,720,000	
Dec. 13, 1922	A. M.	35.0	1,830,000	Intraperitoneal transfusion with 100 c.c. citrated blood (new donor)
Dec. 14, 1922	A. M.	35.0	1,750,000	
Dec. 15, 1922	A. M.	54.6	2,810,000	
Dec. 16, 1922	A. M.	56.0	2,990,000	
Dec. 18, 1922	10:00 A. M.	54.6	3,250,000	Intraperitoneal transfusion with 100 c.c. citrated blood (same donor) at 11:00 A. M.
	12:00 P. M.	56.0	3,820,000	
	2:00 P. M.	59.5	4,120,000	
	4:00 P. M.	56.0	3,420,000	
Dec. 19, 1922	4:00 P. M.	56.0	4,390,000	
Dec. 20, 1922	A. M.	59.5	4,250,000	
Dec. 21, 1922	A. M.	70.0	4,670,000	
Dec. 22, 1922	A. M.	63.0	4,000,000	
Dec. 23, 1922	A. M.	63.0	4,240,000	
Dec. 26, 1922	A. M.	77.0	4,120,000	
Dec. 29, 1922	A. M.	66.5	3,900,000	
Dec. 30, 1922	A. M.	66.5	3,840,000	
Jan. 2, 1923	A. M.	66.5	4,250,000	
Jan. 4, 1923	A. M.	70.0	4,090,000	
Jan. 6, 1923	A. M.	70.0	4,250,000	
Jan. 8, 1923	A. M.	63.0	3,710,000	
Jan. 10, 1923	A. M.	66.0	3,970,000	
Jan. 12, 1923	8:00 A. M.	59.5	3,040,000	
	10:00 A. M.	56.0	3,800,000	Intraperitoneal transfusion with 150 c.c. citrated blood (same donor) at 9:00 A. M.
	11:00 A. M.	56.0	3,500,000	
	12:00 P. M.	56.0	3,370,000	
	1:00 P. M.	56.0	3,760,000	
	2:00 P. M.	58.0	3,670,000	
	3:00 P. M.	58.0	3,430,000	
Jan. 13, 1923	A. M.	63.0	3,140,000	
Jan. 15, 1923	A. M.	63.0	3,410,000	
Jan. 16, 1923	A. M.	63.0	3,490,000	

the benzidine and a negative guaiac reaction. Other specimens were negative.

Nov. 16, 1922. General condition good. Purpuric spots beginning to fade.

Nov. 18, 1922. Given 300 c.c. citrated blood intraperitoneally. Moderate temperature reaction. No subjective symptoms. Urine and feces specimens were negative for occult blood.

Nov. 21, 1922. Gradual improvement. Purpuric rash almost gone.

Nov. 22, 1922. Intraperitoneal transfusion with 200 c.c. citrated blood with no temperature or pulse reaction.

Dec. 6, 1922. The patient is improving daily. The blood picture is normal.

Dec. 12, 1922. The tonsils and adenoids have been removed with only a moderate reaction.

Jan. 25, 1923. Dispensary note. The patient is in excellent condition.

Upon entrance into the hospital, the only mea-

sure considered was an immediate intravenous transfusion. This was done twice to overcome the acute condition. The virulence of the infecting agent can be realized if one considers that, after the intravenous introduction of 700 c.c. of blood (the total blood volume of the patient is approximately 1000 c.c.), the blood values were 30 per cent hgb., 1,656,000 red blood cells respectively. After the hemorrhage was stopped, the intraperitoneal method was utilized to hasten recovery. Data available and results obtained are shown in Table III.

POST-MORTEM STUDIES

The opportunity to examine the peritoneal contents of patients who have received transfusions is limited. Evidence of blood absorption and of blood destruction through indirect methods are neces-

TABLE II—*Continued*
Comparative Data Regarding Hemoglobin and Erythrocyte Counts (Case No. 5)

Date	Time	Blood counts		Remarks
		Hgb. %	R.B.C.	
Jan. 18, 1923	A. M.	63.0	3,800,000	
Jan. 20, 1923	A. M.	60.5	4,200,000	
Jan. 21, 1923	A. M.	62.0	3,900,000	
Jan. 25, 1923	A. M.	60.0	3,890,000	
Jan. 27, 1923	A. M.	63.0	4,000,000	
Feb. 16, 1923	.....	38.5	2,780,000	
Feb. 21, 1923	.....	32.0	2,300,000	
Feb. 23, 1923	A. M.	32.0	2,280,000	
Feb. 26, 1923	.....	28.0	2,150,000	Intraperitoneal transfusion with 100 c.c. citrated blood (4:00 P. M.)
Feb. 27, 1923	9:00 A. M.	31.5	2,440,000	
	2:00 P. M.	35.0	2,550,000	
Feb. 28, 1923	9:00 A. M.	31.5	2,160,000	
Mar. 3, 1923	.....	35.0	2,600,000	
Mar. 7, 1923	.....	35.0	2,450,000	
Mar. 29, 1923	.....	21.0	1,380,000	Has received x-ray, ultra-violet rays and Fowler's solution
Mar. 31, 1923	9:00 A. M.	21.0	1,430,000	Intraperitoneal transfusion with 100 c.c. citrated blood (9:00 A. M.)
	3:00 P. M.	21.0	1,530,000	
Apr. 1, 1923	A. M.	21.0	1,600,000	
Apr. 2, 1923	10:00 A. M.	28.0	1,810,000	Intraperitoneal transfusion with 100 c.c. citrated blood (9:00 A. M.)
Apr. 3, 1923	3:00 P. M.	28.0	1,800,000	
	10:00 A. M.	28.0	1,920,000	
Apr. 4, 1923	3:00 P. M.	38.5	2,380,000	
	.....	38.5	3,000,000	Intraperitoneal transfusion with 100 c.c. citrated blood (9:00 A. M.)
Apr. 6, 1923	.....	45.0	3,830,000	
Apr. 7, 1923	.....	45.0	3,800,000	
Apr. 9, 1923	.....	45.0	3,800,000	
Apr. 11, 1923	.....	45.0	3,400,000	
Apr. 12, 1923	.....	56.0	3,500,000	Intraperitoneal transfusion with 150 c.c. citrated blood
Apr. 17, 1923	.....	....	3,300,000	
Apr. 18, 1923	.....	52.0	3,480,000	

sarily subject to criticism. Methods available at the present time are not satisfactory. Consequently direct observation is the only certain way of determining whether blood is absorbed from the abdominal cavity. Observations of this character are few in number. Opportunities for study following injury of some organ in the abdominal cavity, while more numerous, present problems not directly comparable with those resulting from intraperitoneal transfusions. The following cases are reported in an attempt to gain more direct and accurate data upon this question.

CASE 7 (H7287).—Athrepsia.

A girl aged seven weeks was brought into the hospital Dec. 7, 1922. The complaint was undernutrition. The physical examination showed marked underdevelopment and dehydration. The weight on entrance was 2,060 grams. There was very little improvement in her condition during the week following her admission. She was given a sinus transfusion of 60 c.c. citrated blood, but there was no rise in blood values.

Dec. 18, 1922. Weight, 2,300 grams. Feeding changed from Czerny's butter-flour mixture to casein milk because of a developing diarrhea.

Dec. 20, 1922. Given 100 c.c. citrated blood intraperitoneally.

Dec. 23, 1922. Sudden cyanotic attack with labored respiration. Temperature 97 degrees F. There is evidence of bronchopneumonia in the right lower lobe. The patient died two days later.

Post-mortem findings showed 50 c.c. of thick, viscous blood in the peritoneal cavity. There were no clots, adhesions or evidence of peritonitis. There was a massive bilateral bronchopneumonia.

CASE 8 (I-33).—Streptococcic meningitis.

A girl aged ten months was brought into the hospital January 2, 1923, complaining of cough, fever, and fretfulness of four days' duration. The physical examination showed an apathetic infant with a markedly bulging anterior fontanelle; neck rigidity; median strabismus; *tâche cerebrale*; and a positive Babinsky and Kernig. The urine examination was negative. The leucocyte count was 18,000. The spinal fluid was milky and under increased pressure; the Nonne was positive; cell count 7,700 cells per cu. mm. and smears showed numerous streptococci.

Jan. 4, 1923. Spinal fluid shows 43,000 cells per cu. mm. The patient is moribund. She was given 100 c.c. of citrated blood intraperitoneally at noon and died twelve hours later.

Post-mortem findings showed apparently no absorption. The smears of the abdominal contents showed unchanged red blood corpuscles.

CASE 9.—Service of Dr. Max Seham. A boy, seven weeks old, admitted to hospital care Jan. 7, 1923, because of persistent vomiting and loss of weight. The present illness started January 1, 1923, with projectile vomiting. The fluid loss was replaced by rectal and intraperitoneal injections of saline. On January 19, the abdomen was

opened under local anesthesia and a Rammstedt operation performed.

Immediately following the operation, food was retained for longer periods, but vomiting continued. Intraperitoneal blood was given thirty-six hours before death (January 21, 1923).

The post-mortem showed approximately 80 c.c. of fluid and clotted blood in the peritoneal cavity.

CASE 10 (I-3997).—Prematurity athrepsia, lues.

A two months' premature baby girl was admitted to the hospital because of failure to gain in weight and constipation. The baby had been breast fed the first two weeks of life and then placed on Borden's Eagle Brand condensed milk without showing any gain. On entrance, the weight was 2,170 grams. Physical examination showed an extremely emaciated, dehydrated infant.

The laboratory findings showed an essentially negative urine. The blood picture was 38.5 per cent hemoglobin; 2,600,000 red blood cells; 23,200 leucocytes with 46 per cent polymorphonuclears and 50 per cent lymphocytes. The Wassermann reaction was repeatedly positive.

For two days after the entrance the baby received normal saline intraperitoneally (125 c.c. b.i.d.). On the third day, it was given 75 c.c. of citrated blood intraperitoneally. There was no reaction. Its weight gradually increased to 2,790 grams and she appeared somewhat improved. On the third day, the course became rapidly worse. The patient died six days after the transfusion.

At the post-mortem the peritoneal cavity was perfectly clean and showed no trace of blood. There were no clots, adhesions, or evidences of peritonitis.

An analysis of our post-mortem results is of interest. In order to present them more clearly we have tabulated the data obtained (Table IV).

These results indicate clearly, in our opinion, that, in these cases, we may have a contraindication towards the intraperitoneal injection of blood. While the post-mortem findings have failed to show any evidence of harm resulting from the procedure they have shown that its value is questionable in this type of case. The clinical condition of these patients must be considered. At the time of the transfusion all physiological processes were undoubtedly slowed. However, if absorption does not take place within a reasonable period in cases of athrepsia, the intraperitoneal route is not justified. Its value, we believe, is directly proportional to the rapidity of absorption of the blood from the peritoneal cavity.

DISCUSSION

a. Puncture of the Peritoneal Cavity.

The introduction of a needle into the abdominal cavity, while theoretically fraught with danger, has been shown by numerous observers to be safe practically. With the proper training and precautions,

abdominal puncture is harmless. The introduction of saline and glucose solutions into the peritoneal cavity is done almost routinely in many pediatric centers without ill effects. The popularity of the method and its harmlessness are attested to by the abundant literature on this subject. We recently had the opportunity of observing two cases at post-mortem, who had received 25 to 50 intraperitoneal injections of normal saline respectively. There was

no evidence of peritonitis or adhesions in either case.

b. Value of Blood in the Peritoneal Cavity.

In a previous paper we have shown, in some detail, the importance of blood in the abdominal cavity. We pointed out that patients suffering internal hemorrhages recover much more rapidly than others who lose an equivalent amount of blood externally. We also emphasized the significant fact

TABLE III
Comparative Data Regarding Hemoglobin and Erythrocyte Counts (Case No. 9)

Date	Time	Blood counts Hgb. %	R.B.C.	Platelet count	Remarks
Nov. 9, 1922	5:00 P. M.	65.0	3,900,000	35,000	Intravenous transfusion 200 c.c. citrated blood
Nov. 10, 1922	9:00 A. M.	45.5	3,170,000	45,000	Intravenous transfusion 450 c.c. citrated blood
Nov. 14, 1922	A. M.	30.0	1,656,000	65,000	
Nov. 15, 1922	9:00 A. M.	40.0	2,140,000		Intraperitoneal transfusion with 70 c.c. of citrated blood at 10 A. M.
	1:00 P. M.	34.0	1,600,000		
	2:00 P. M.	34.0	1,940,000		
	3:00 P. M.	34.0	1,810,000		
	4:00 P. M.	34.0	2,000,000		
Nov. 16, 1922	9:00 A. M.	38.0	2,000,000	65,000	
	3:00 P. M.	42.0	2,050,000		
Nov. 17, 1922	A. M.	49.0	2,400,000	250,000	
Nov. 18, 1922	10:00 A. M.	38.0	2,000,000		Intraperitoneal transfusion with 300 c.c. citrated blood at 11:00 A. M.
	12:00 P. M.	44.8	2,438,000		
	3:00 P. M.	48.0	2,550,000		
Nov. 19, 1922	A. M.	53.0	2,640,000		
Nov. 20, 1922	A. M.	49.0	2,670,000	245,000	
Nov. 21, 1922	A. M.	48.0	2,760,000		
Nov. 23, 1922	A. M.	51.0	2,900,000		
Nov. 24, 1922	A. M.	56.0	3,370,000	320,000	
Nov. 25, 1922	A. M.	61.0	3,600,000	510,000	
Nov. 27, 1922	A. M.	61.0	3,220,000		
Nov. 28, 1922	8:00 A. M.	56.0	3,500,000	400,000	Intraperitoneal transfusion with 200 c.c. citrated blood at 9:00 A. M.
Nov.	11:00 A. M.	66.5	4,070,000	335,000	
	12:00 P. M.	70.0	4,230,000		
	2:00 P. M.	70.0	4,340,000		
	3:00 P. M.	65.0	3,880,000		
	4:00 P. M.	66.5	4,350,000		
Nov. 29, 1922	P. M.	59.0	3,900,000		
Dec. 1, 1922	A. M.	73.5	4,460,000		
Dec. 2, 1922	A. M.	77.0	4,350,000		
Dec. 5, 1922	A. M.	77.0	4,800,000	205,000	
Dec. 6, 1922	A. M.	80.0	5,000,000		
Dec. 7, 1922	A. M.	80.0	5,000,000		
Dec. 16, 1922	A. M.	80.0	4,390,000		
Dec. 19, 1922	A. M.	80.0	4,560,000		

that auto-transfusion and retransfusion of blood obtained from the peritoneal cavity is being used successfully.

Free blood in the abdomen has been shown to be harmful because of the danger of clots with the subsequent formation of adhesions. For obvious reasons, the presence of citrated blood has not been, as yet, proved harmful. Available data obtained at post-mortem would tend to show that its presence in the peritoneal cavity is without ill effect. We are at present engaged in a histological study of available clinical cases and hope to report the results obtained later.

c. Absorptive Power of the Peritoneal Cavity.

We realize that the application of animal experimentation to human beings has its limitations. However, it is felt that a thorough discussion and a careful clinical application may be of practical importance.

A careful review of the literature shows that we have undoubtedly under-estimated the absorptive capacity of the abdominal cavity and, furthermore, have to a large extent failed to avail ourselves of this property, and utilize this knowledge.

The mechanism involved is of considerable importance. Von Recklinghausen, Notkin, Beck, Muscatello, Meltzer, MacCallum, and others support the lymphatic theory of absorption. On the other hand, men like Starling and Tubby, Hamburger, Mendel, Dandy and Rowntree favor the blood-vessel theory of absorption.

Later evidence favors the lymphatic theory. It has been shown repeatedly that the lymphatics of the diaphragm play a very important rôle in the process of absorption. Cunningham⁵, in a very thorough and conservative paper, has recently made the following statement: "The results of my own experiments indicate that most, if not all, of the transfer of granular material from the peritoneal cavity into the diaphragmatic lymphatics, during the first 30 min., takes place by means of a type of phagocytosis. That later on leucocytes do bring in loads of granules is undoubted, but it seems very likely that the large inflow of free granules continues so long as any remain free in the peritoneal cavity."

Rate of absorption, for obvious reasons, can only be estimated by indirect methods. We have shown that rabbits can absorb one-fifth of their total blood volume in approximately three hours. It may be assumed for the present that many factors are involved. The general condition of the patient; the amount of blood transfused; the number of transfusions already given; the interval between transfusions; the condition of the donor's and recipient's blood; the rate and depth of respiration; the movements of the diaphragm; the intra-abdominal pressure; and possibly many other factors are of importance. Bolton⁶ has shown that movements caused by artificial respiration were sufficient to force materials from the peritoneal cavity into the lymphatics of the diaphragm of animals dead for

TABLE IV
Data showing results obtained at post-mortem (Intraperitoneal transfusion)

Case No.	Age	Weight in Grams	Condition of patient	Diagnosis	Amount injected c.c.	Autopsy	Amount recovered c.c.	Remarks
H5325	23 days	2,350	Poor	Decomposition (Athrepsia)	100	3 days	30	Fluid blood; no adhesions; no clots
H7287	49 days	2,300	Poor	Athrepsia	100	5 days	50	Thick viscous; no clots or adhesions
I 33 H	10 mos.	....	Critical	Streptococci meningitis	100	12 hrs.	100	No absorption
12	42 days	2,700	Serious	Pylorus Stenosis with operation	100	36 hrs.	80	Fluid blood and clots; no absorption
I 1127	41 days	2,490	Serious	Prematurity 3° Cleft Palate	100	48 hrs.	20	No clots; no ad- hesions
I 3997	42 days	2,170	Serious	Prematurity— Lues	75	6 days	0	No clots; no ad- hesions; no peri- tonitis

several hours. The possible importance of auto-agglutinins and isoagglutinins in the blood may deserve consideration.

At the present time, the only means of estimating rate of absorption are the temperature curve and the repeated blood examinations. Their value is of course doubtful from a scientific standpoint. However, we are inclined to think from the available data that the rate of absorption of citrated blood from the peritoneal cavity of the child is at first very rapid, then gradually slows down until the process is completed. Further research along this line is needed. The ultimate question is not one of absorption, but rate of absorption.

d. Comparative Reactions and Results Following Intraperitoneal and Intravenous Transfusions.

Careful observations of temperature reactions show more or less characteristic curves. It has been noted that, in our cases at least, both intraperitoneal and intravenous transfusions are followed, in most instances, by some degree of reaction. Most careful attention to technical details has been unable, in our hands, to obviate this reaction.

In Figures 1 and 2 there have been gathered together a series of typical reactions following blood transfusions. It can be seen at once that we are dealing with two types of curves. The sudden sharp rise with the sharp fall seem to be characteristic of the intravenous transfusion.

The slower rise, plateau, and gradual drop are apparently as characteristic of the intraperitoneal transfusion. It may be noted that fairly severe reactions may occur from the use of either route. However, the intravenous injection of blood seems to give the more severe temperature rise. It needs to be emphasized, though, that the reactions were, in all instances, only transitory, and had apparently no deleterious effect upon the patient.

As might be expected, the pulse rate as a rule goes hand in hand with the rise in temperature. It apparently returns to normal sooner than the latter. At no time were the pulse rates alarming and no irregularity of heart-beat discernible.

General symptoms, such as malaise, headache, pain, etc., were noted in a minor degree in a few cases. They applied equally well to both forms of

TABLE V
Data showing results obtained following intravenous transfusion

Case No.	Age	Condition of patient	Diagnosis	Amt. of blood transfused c.c.	BLOOD PICTURE				Remarks
					Before transfusion Hgb. %	R.B.C.	After transfusion Hgb. %	R.B.C.	
H7287	7 wks.	Poor	Athrepsia	60	...	4,870,000	...	4,870,000	No effect
H7075	6 wks.	Serious	Athrepsia	60	75.0	4,010,000	70.0	4,540,000	Rise in red count; no clinical change
I 440	9 wks.	Poor	Athrepsia	80	63.0	3,890,000	78.4	5,430,000	Marked improvement
H7152	2 mos.	Serious	Athrepsia Broncho-pneumonia	100	80.0	4,400,000	...	5,200,000	Definite rise in red cells
H6046	(?)	Serious	Athrepsia Dehydration	50	85.0	4,450,000	...	.....	Died 2 days later
H5102	3 mos.	Poor	Congenital lues; Acute otitis media	150	70.0	3,100,000	91.0	5,400,000	Marked improvement
H6656	3 yrs.	Serious	Purpura Hemorrhagica	650	65.0	3,900,000	30.0	1,656,000	Blood destruction
I 2044	9 mos.	Poor	Malnutrition	100	75.0	3,500,000	56.0	4,600,000	Good result
I 987	17 days	Serious	Prematurity	50	...	.....	...	.....	No effect clinically
I 2545	5½ yrs.	Poor	Hemorrhagic Nephritis	300	24.0	1,800,000	42.0	3,000,000	Good result
I 1926	6 yrs.	Poor	Pulmonary Tuberculosis	300	56.0	3,300,000	84.0	4,400,000	Good result

TABLE VI

Data showing results obtained following intraperitoneal transfusion

Case No.	Age	Condition of patient	Diagnosis	Amt. of blood trans- fused c.c.	—BLOOD PICTURE—				Remarks
					Before transfusion		After transfusion		
					Hgb. %	R.B.C.	Hgb. %	R.B.C. (variable periods)	
H4981	2 yrs.	Fair	Secondary Anemia	50	38.0	4,000,000	45.0	4,300,000	
		9 days later		100	45.0	4,500,000	55.0	6,000,000	Marked improvement
H5102	3 mos.	Poor	Congenital lues	50	59.5	3,930,000	56.0	4,280,000	No clinical results
H5694	16 mos.	Poor	Hemoglobinuria	50	28.0	3,760,000	35.0	4,300,000	
		2 days later		50	29.4	4,170,000	35.0	4,000,000	Values rose two days later to 43.4% and 4,700,000
		6 days later		150	52.5	5,440,000	49.0	5,400,000	Values rose next day to 52.5% and 6,260,000
H6131	2 yrs.	Poor	Malnutrition	150	90.0 (Dare)	4,320,000	85.0 (Dare)	4,610,000	See Table I
H6481	3 mos.	Poor	Athrepsia	50	70.0	3,400,000	70.0	3,640,000	Good clinical result;
		3 days later		50	...	.....	68.0	3,900,000	blood picture not
		2 days later		100	...	.....	70.0	4,000,000	improved
H6419	15 mos.	Fair	Secondary anemia; Rickets	50	50.0	3,900,000	65.0	5,230,000	Taken 5 days later
		9 days later		100	...	.....	56.0	5,400,000	Taken 5 days later; good clinical result
H7356	5 mos.	Serious	Secondary Anemia	100	35.0	1,310,000	38.0	1,520,000	
		2 days later		100	35.0	1,830,000	54.6	2,810,000	Taken 2 days later
		5 days later		100	54.6	3,250,000	56.0	3,420,000	See Table III
		25 days later		100	59.5	3,040,000	58.0	3,430,000	
H6656	3 yrs.	Critical	Purpura Hemorrhagica	70	40.0	2,140,000	34.0	2,000,000	
		3 days later		300	38.0	2,000,000	48.0	2,550,000	
		10 days later		200	56.0	3,500,000	66.5	4,350,000	
I 1419	23 days	Serious	Prematurity Erysipelas	50	...	.....	...	.....	Died 12 days later; no clinical effect
I 2248	6 days	Serious	Prematurity 3° Cleft Palate	35	...	.....	...	.....	Good clinical effect
I 2183	7 wks.	Serious	Erysipelas Secondary anemia	70	...	.....	...	.....	Marked clinical im- provement
Case of Dr. M. Gellman	11 mos.	Serious	Pneumonia Secondary anemia	150	20.0	2,800,000	60.0	4,310,000	Taken 6 days later

transfusion. These symptoms also were transitory, and cannot justly act as contraindications.

In Tables V and VI, we have summarized, for purposes of comparison, the results obtained after intraperitoneal and intravenous transfusions.

It can be seen that six out of eight cases receiving intraperitoneal transfusions were apparently benefited. In eleven other cases, receiving intravenous transfusions (Case 6046 died too soon for comparison), seven appeared to be improved. It is realized that direct comparisons, due to different etiological and clinical factors, cannot be made. Tentative conclusions are, however, justified.

The occasional limitations of even direct intravenous transfusions are shown. Any explanation, due to our present lack of knowledge concerning blood physiology⁸ is necessarily uncertain. Blood destruction may apparently take place very rapidly without showing any evidence obtainable by routine laboratory procedures. Hoover and Blankenhorn⁹ have demonstrated that bilirubin may be present in marked concentration in the plasma and yet not appear in the urine.

SUMMARY

We have discussed the general theoretical and practical considerations concerning the intraperitoneal transfusion of citrated blood. Based upon a considerable amount of laboratory and clinical data obtained from all available sources, we have pointed out the practicability of this method of giving blood during infancy and childhood. The necessity for such a method of approach, its simplicity of technique, its apparent harmlessness, and the beneficial results have all been discussed. We have tried to emphasize both in the present paper, and in previous communications that this method is proposed, not as a substitute for other methods already in use, but as an addition, of possible merit, to our pediatric armamentarium.

Laboratory experiments have preceded our clinical trials. Our clinical attempts have, we believe, met with a fair measure of success. Clinical results are especially striking in cases of anemia, that is, in cases requiring blood transfusions, not primarily as stimulative agents, but as restorers of blood loss.

The limitations of the intraperitoneal route, its possible dangers, and its ultimate value remain to be seen. Only carefully conducted laboratory and

clinical investigations will tell us ultimately what we may expect from the abdominal cavity as a source of communication with the rest of the body.

The importance of the rate of absorption has been emphasized. Upon this may depend the future use of various other medications, for example, antitoxin.

CONCLUSIONS

1. The intraperitoneal transfusion of citrated blood has apparently given good results in clinical cases of anemia.
2. Its value in severe nutritional disturbances (athrepsia) is questionable.
3. Reactions following intraperitoneal transfusions are comparable to those following intravenous transfusions, but are apparently not as severe.
4. In over 50 clinical applications we have seen no harmful effect following the use of this procedure.
5. Carefully controlled clinical studies are essential to determine its possible future status.

It is again a pleasure to acknowledge Dr. E. J. Huenekens' kind permission to utilize and report the cases reviewed.

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THE TREATMENT OF NON-TUBERCULOUS PULMONARY SUPPURATION*

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Non-tuberculous pulmonary suppuration includes abscess, bronchiectasis, and suppurative pneumonitis. Pulmonary abscess may be acute, chronic, simple, multilocular, or multiple. Bronchiectasis may be localized or diffuse. Suppurative pneumonitis may involve a localized portion of a lung or a whole lobe. Bronchiectasis, as observed clinically, is usually chronic and of long standing. Suppurative pneumonitis is essentially acute. In chronic conditions abscess and bronchiectasis often co-exist, and either may be secondary to the other. The treatment of pulmonary suppuration, to be rational, must be based on the nature, localization, and clinical course of the disease in the given case.

1. In cases of pulmonary abscess, expectant treatment, bronchoscopic lavage, pneumothorax collapse, drainage, and partial or complete lobectomy have their advocates. In many acute cases there is secondary pleuritis of such an extent that localization, either by physical findings or x-ray, is impossible. Expectant treatment, in my opinion, is indicated in the early stages of the lesion, but before liquefaction has taken place drainage would probably be of no immediate benefit. In a considerable proportion of cases spontaneous cure results. Most cases, however, when observed at the Mayo Clinic had lasted long enough for a definite abscess to form. I believe that expectant treatment in such cases is indicated, only if patients show definite evidence of improvement, or at least if they hold their ground during a few weeks of observation. To continue expectant treatment indefinitely, unless there is such improvement, will allow the condition to become chronic, the patient will come to operation in relatively poor condition, and the results following operation will be much less satisfactory, because of the changes characteristic of a chronic process. Bronchoscopic lavage may be of some benefit in cases in which the abscess is located centrally, but such abscesses are likely to heal spontaneously. Pneumothorax collapse is probably of value in cases in which

the abscess is located centrally because it promotes collapse of the abscess walls and this facilitates healing. In peripheral abscesses, on the other hand, the nearest exit for the pus is through the chest wall, and not through a bronchus, with perhaps a relatively narrow sinus opening which allows imperfect drainage. If the abscess is in the periphery, adhesions may be present which prevent collapse of the portion of the lung involved, or, if collapse is achieved, there is danger of rupture into the pleural cavity and of secondary empyema. Peripheral abscesses should be drained by a two-stage operation because of the protection afforded against infection of the pleural cavity, unless it can be shown definitely at the first operation that the pleura is adherent over the area involved. This point can usually be determined by inspection; if there are extensive adhesions, a marked thickening of the pleura underneath the endosteum of the excised rib or underneath the intercostal muscles will be found. In any case in which there is doubt as to the presence of extensive adhesions a two-stage operation is the safest course. In some cases, however, drainage is so urgently indicated that it may be safer to suture the pleura and to establish immediate drainage.

I have usually found it possible to localize the abscess definitely by means of the aspirating needle. With the needle in place, a tract is then burned to the abscess, affecting a wide open drainage of the abscess cavity. In a few cases in which it was impossible to localize the abscess by this means, a tract was burned to the area suspected and the drainage tract packed. In such cases the abscess is likely to break into the drainage tract later, or the tract may be further cauterized at later sittings. If the abscess is fairly large and there is severe coughing and much sputum, it is a distinct advantage to leave the ribs in place after separating the periosteum. The lung can then be sutured to the parietal pleura underneath the ribs; the ribs act as a splint, preventing pain and difficulty in raising sputum during the interval before the second stage of the operation, which is usually performed about a week later, when the abscess is localized with the aspirating needle and the ribs are resected. In cases of chronic abscess of long standing, in which the x-ray and physical findings show definite localization, cautery lobectomy according to the method of Graham, offers the best chance of cure. In my experience, however, hemorrhage has been a fatal complication in two

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cases following cautery. In many chronic cases drainage is ineffective because of extensive sclerosis of the portion of the lung involved. A combination of drainage and cautery, particularly in cases of multiple abscesses, seems a rational procedure. Very large cavities ultimately heal, provided all the secondary pockets are widely drained.

2. Bronchiectasis is usually diffuse but may be localized. In the latter type, in which the *x*-ray shows a definite, sharply circumscribed shadow at the base, drainage has, in my experience, produced very marked improvement so long as the drainage opening has been kept patent. In the diffuse type of bronchiectasis, however, drainage is obviously contra-indicated. This condition has been generally considered practically incurable except by lobectomy; this operation has yielded a prohibitive mortality except possibly in a small group of selected cases in which the mortality has been about 50 per cent and the proportion of complete cures relatively low.

In cases of diffuse unilateral bronchiectasis, I have in the last few years performed a graded, extrapleural thoracoplasty. This operation, when sufficiently extensive to produce massive collapse of the involved portion of the lung, has resulted in improvement in all cases, and approximates a symptomatic cure in a considerable proportion. The operation has been performed typically in five stages: resection in two stages of the ribs posteriorly, including usually the third to the eleventh, resection of the remaining lower lateral segments, resection of the upper anterior segments, and resection of the remaining median segments of the upper ribs. Combined local and gas and oxygen, or ethylene anesthesia is used. After the resection of the posterior segments the nerve trunks are isolated and injected, under direct vision, with 95 per cent alcohol. The convalescence in these cases is relatively painless, and thus the patients do not object to a several stage operation. Coughing is also relatively painless, which is important in the prevention of retention of sputum, as the patient voluntarily inhibits the coughing reflex if coughing is painful. The third advantage in the injection of the nerve trunks is that the operative field for the resection of the anterior and lateral segments of the ribs is relatively free from pain. The anesthetic effect of the injection lasts for several months. Drainage is instituted for from twenty-four to forty-eight hours following each operation. Practically without exception, healing occurs

by primary intention, and the patient is up and about usually within twenty-four or forty-eight hours. The operations are performed at intervals of about one week. Such treatment is obviously indicated only in cases of unilateral bronchiectasis. It may be difficult to determine whether the condition is unilateral or bilateral. It was unilateral in 28 per cent of 400 cases studied at the Mayo Clinic. There was a question as to whether it was unilateral or bilateral in 35 per cent. In this second group it may be impossible, by physical findings or by the *x*-ray or bronchoscopic examinations, to determine the extent of the involvement. A pneumothorax collapse of the side chiefly involved has been used as a therapeutic test. If, following complete collapse of the lung, the symptoms have largely disappeared, extrapleural collapse is indicated. If, on the other hand, the symptoms continue in large measure, the condition is regarded as probably bilateral, and operation is not advised.

3. In certain cases of pulmonary suppuration the patient's chief symptoms are a chronic cough and large amounts of purulent sputum. The physical findings and the *x*-ray show typical signs of a unilateral involvement, but owing to thickened pleura and shadows produced by pulmonary lesions it may be impossible to determine whether the condition is abscess or bronchiectasis, or a combination of the two. Drainage obviously is not to be considered. A question of lobectomy would have to include the possibility of resecting a whole lung. Extrapleural collapse is a relative indication. If there is a history of frequent exacerbation of fever, leukocytosis, and a poor general condition, it is probable that the primary condition was multiple abscess. Extrapleural collapse is ineffective because of the failure to produce better drainage, and in such cases the mortality will be considerable. If, however, the clinical course is essentially that of bronchiectasis alone, very marked improvement may be expected following extrapleural collapse.

Suppurative pneumonitis is a condition which usually occurs as a complication of multiple abscesses or of abscess secondary to bronchiectasis, and often is fatal. If the process is localized to one lobe, and the patient's general condition is satisfactory, a lobectomy seems the operation of choice.

Footnote: A large number of slides, illustrative of the various types of pulmonary suppuration and of operative technic, were shown.

CONCLUSIONS BASED ON THE STUDY OF 433
HAND INJURIES*

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An attempt has been made in this paper to enumerate the methods used and conclusions arrived at through the investigation and study incident to the treatment of 433 hand injuries.

The reason, I believe, for lack of better functional results in a large percentage of injuries of the hands is to be found, not so much in the lack of knowledge of anatomy and pathology of these conditions, as it is in the indifference and lack of respect for the various tissues and their occasionally complicated and delicate mechanisms, together with a profound disregard for the formation of scar tissue and the resulting deformities. A tendon, with its extremely delicate gliding mechanism, cannot be grasped in a forceps as one grasps the fascia in an abdominal wound, without causing tissue death and hemorrhage, either condition being sufficient to put to naught an otherwise skillful repair. A finger that is incised longitudinally on its palmar aspect will not fold at its horizontal flexion crease nor will its tendon gliding mechanism function perfectly if the tendon slings are severed. An infection which is seen once in three or four days can advance until it is quite out of control, whereas very little progress in the wrong direction is made in twenty-four hours, and if the case is seen daily this can be arrested. Such omissions as the above are usually made not because of ignorance, but rather from the fact that the case is merely that of an infected finger or hand and therefore does not merit much consideration. In many fingers or hands partial or total permanent disability can be prevented simply by careful attention daily, and mere observance of ordinary surgical principles without any knowledge or technique, especial or peculiar to the hand itself.

Our series of cases were divided as follows:

Number of cases.....	433
Lacerations	171
Cases coming to us as infections...	99
Contusions	96
Fractures	54

Phalanges	36
Metcarpals	17
Carpals	1
Foreign bodies	36
Burns	12
Dislocations	4
Palmar space infections.....	5
Average period of disability for	
lacerations	5.3 days
Infections in primary wounds.....	4.8%

The lacerations were treated on the assumption that it is practically impossible to sterilize a traumatic wound and therefore (and this thought being of major importance) that the wound be not sutured or, in case sutures are used, a few widely separated ones loosely tied.

According to the accepted teaching if a wound is seen immediately or within a certain number of hours after its occurrence, it may be rendered aseptic as possible and closed tightly. There are at least two factors that may defeat our purpose in such treatment. The first is that of swelling due to the trauma associated with the injury. This, following the tight suturing, causes the suture to be put under still more tension, tending toward the cutting through of the sutures and increasing the likelihood of infection. Secondly, the ever present risk of infection in spite of attempts at cleansing. In the tightly sutured wound there is no chance for the escape of small amounts of serum or infectious material until these have increased in such amount as to be recognized and by that time caused serious damage.

A great many methods and solutions have been used in an attempt to render the surfaces of the wounds sterile: scrubbing with green soap and water, ether, iodine, saline, primary Dakinization and any one of these methods together with débridement. In extensive and deeply lacerated wounds a thorough débridement should be done, care being taken to remove all tissue irreparably destroyed, while being equally careful not to sacrifice any parts which aid in procuring a better cosmetic or functional result. Control of hemorrhage is not as important as it is in other regions due to the relative firmness of the part and the ability of moderate pressure to control bleeding. In primary tendon repair, however, the control of bleeding is very important as a small collection of blood in the tendon sheath may cause trouble-

*Read at the meeting of the staff of the Charles T. Miller Hospital, April 1, 1924.

some adhesions. In the repair of a tendon a thorough débridement is also necessary as any bruised or badly lacerated tendon is almost certain to slough. In wounds which are extensive, either lacerations or crushing injuries, or a combination of the two, the question of injury to tendons should be definitely settled insofar as it is possible before the patient is anesthetized, and then a careful investigation and the necessary repair done. It is very distressing to casually suture an apparently superficial wound and afterward find that an injured tendon has been overlooked.

In extensive wounds we follow the practice of cleaning the area about the wound with benzine, followed by alcohol or iodine. The gross dirt is cleaned out of the wound and all tissue which is hopelessly destroyed is removed. Not a great deal of attention is paid to the sterilizing of the wound itself; however, it seems to be of some value to wash out the wound with ether. The question of tetanus and the administration of antitoxin depend upon the conditions surrounding the patient's vocation. As most of our men were factory or shop workers tetanus antitoxin was used very rarely and we have no tetanus in our series.

Any of the stronger antiseptics which are caustics and therefore cause cell death, certainly diminish the regenerative power of the tissue and thus delay union. We have occasionally used blue ointment as a primary wound dressing with good results as a preventive of infection but this has the disadvantage of leaving a moist, soggy wound the edges of which do not adhere by primary union. A dry wound is usually a clean wound, hence the importance of daily attention. Twenty-four hours after dressing a lacerated wound which has been débrided, the dressings are very carefully removed, the wound inspected and if any minute collections of secretion are seen they are gently removed with dry cloths; a dry dressing is then re-applied. It has not been sutured tightly and a collection of infectious material does not have to increase to any large amount before forcing itself to the surface. If any reddening or pain is noted the edges of the wound are spread slightly. If on the third or fourth day the signs of infection are certain the wound is treated in an entirely different manner and as an infection. In fractures of the phalanges or metacarpals complicated with wounds on the flexor surface, the daily attention is especially important as the position of the hand over the roller

allows for moisture to collect on the palm. If not changed for thirty-six or forty-eight hours such a wound will almost certainly become infected with the possibility of the infection extending down to the bone. It is almost impossible to treat ideally a fracture and an infection in the same finger or metacarpal as the principles applied in the treatment of one condition are contraindicated in the other. The hand should be cleaned up and powdered daily and there is no danger of disturbing the fragments if the dressing is done carefully.

The idea of trying to save every available bit of finger in partial or nearly complete amputations in the distal half of the finger has been consistently carried out. Very often a finger tip which appears hopelessly severed from its blood supply may be saved by carefully placing it in position and holding it in place with adhesive or a suture to two. Where part of the distal phalanx has been lost and it is important either from the nature of the patient's vocation, or for cosmetic reasons, to increase the finger to as near normal length as possible, the celluloid cuff method of Davis may be tried. A celluloid cuff encircling the finger and extending one inch beyond the end is used as a mould for the granulations, which are allowed and encouraged, to build up the end of the finger. In our series this was tried on two fingers with the addition of about one-fourth of an inch in one case and enough in the other to prevent the necessity of shortening the bone to procure a painless stump.

In lacerations or contusions involving the nail where the nail is raised from its bed, usually at the base, the nail is left in place, but a small piece excised to allow for the escape of blood. In clipping out a piece of nail, care should be exercised not to cut into or traumatize the matrix, as such treatment will result in a deformed nail.

In the repair of tendons the most scrupulous care is to be used in an attempt at as perfect asepsis as possible. Only the gentlest handling of these very delicate tissues with the careful avoidance of even the slightest trauma. As has been mentioned above, it is a waste of time to suture together crushed or lacerated tendons, as owing to the comparatively poor blood supply the tendon is sure to slough. In primary tendon repairs the necessity for supplying a gliding mechanism is not usually present but occasionally a tendon is destroyed over such a distance as to leave a defect which can only be bridged by a tendon graft including the

sheath or paratenon. Depending upon the length of the defect a graft may be taken from the sublimus tendon of the same or another finger, the palmaris longus or various other locations. The ends of the tendon should be approximated as accurately as possible without ragged edges and the sutures applied very carefully. Considering the fact that the suture takes up the pull on working the tendon for several weeks, it is readily seen that a method must be used of firm and lasting application of the suture. The ordinary suture passed through the ends of the tendon and tied will pull out quite promptly and cannot be used. Several methods of suture have been devised, any of which is quite satisfactory.

A tendon is surrounded by a sheath or epitenon only where it changes its direction. In its straight course it is surrounded by loose, flexible long-fibered, fatty tissue called paratenon. This loose connective tissue shows a marked difference, histologically, from ordinary fatty connective tissue. This tissue is adherent to and slides back and forth with the movements of the tendon. In secondary tendon repair following an infection, a gliding mechanism must be furnished if the sheath is destroyed over any great distance if one expects any degree of motion. This means transplanting a tendon, plus its sheath or paratenon. If the tendon is planted directly without paratenon or sheath it gradually becomes adherent to the short-fibered, non-elastic connective tissue and finally is held immobile. Grafts may be obtained from the sublimus, palmaris longus, long extensors of the toes or other regions; paratenon fat may be obtained over the triceps tendon and planted in the sleeve about the tendon. If the injury necessitates suturing the tendon in the middle of the finger enough tendon should be removed to allow one end of the graft to be sutured to the distal phalanx, the other end sutured to the proximal fragment in the palm where limiting adhesions are of less consequence, thus having no suture line in the course of the tendon through the finger. It is not practical to attempt to replace both deep and superficial flexors in the fingers, the profundus only being used in the repair. To do a successful tendon repair and have any degree of function the joints must be quite freely movable as a repaired tendon obviously is not strong enough to loosen up stiffened joints. The limiting adhesions in the joint should be broken up by massage and baking and

put into a condition of maximum flexibility before attempting the repair. If the adhesions do not loosen up or if a chronic arthritis is present a repair is useless. The bed in which the tendon is to be received should be loose and succulent tissue with a good blood supply, not the hard, shiny, reddened, fibrous finger through which the storm of an infection has passed. If the finger is the seat of scars and contractures it may be necessary to make a whole thickness graft in order to prepare a proper tunnel for the new tendon. If this is necessary it may be advisable to amputate the finger rather than go through a prolonged series of operations which may easily result in failure. After the repair, motion should be started early, probably the fourth or fifth day, very carefully of course, but motion none the less, to prevent the organization of microscopic clots and resultant binding adhesions.

Fractures.—Because of the compensation and litigation aspect of our cases we are very anxious to have recorded every fracture, no matter how small and apparently unimportant. For this reason radiographs were made in all cases where there was the slightest possibility of a fracture being present. In spite of including in our series a great number of cases in which the chance for a break was comparatively slight the number positive for fracture was over 50 per cent of the total radiographed. I think this illustrates the fact that fractures of the bones in the hand occur a great deal oftener than are suspected or discovered. This may seem relatively unimportant but in addition to the fact that at least some of the fractures of phalanges or metacarpals unite improperly and with poor or painful function, if not discovered and treated, there is the additional knowledge that in industrial cases an unrecognized fracture, even though it be a trivial injury, can be made to assume gigantic and fearful proportions before a jury.

The fractures of the phalanges and metacarpals are treated in a like manner, simply by putting the hand up in flexion around a roller bandage about 1.5 inches thick and extending across the hand. In cases with much displacement we use nitrous oxide and flex the hand and fingers tightly over the roller bandage. This effectively approximates the fragments and in case of the metacarpals prevents inward or palmar knuckling with a painful callus in the palm. In the case of fractures of the

distal phalanges no splints are used at all unless the patient desires to continue working, when the finger is splinted in extension.

We had in our series thirty-six fractured phalanges and seventeen metacarpals with good results in all but four fractured phalanges in which the fracture extended into the joint, and one metacarpal which became badly infected and in which union was delayed for some time.

Infections.—The average period from the time of receiving the wound or abrasion causing the infection until first treated by us was five and three-tenths days. The number of infections was ninety-nine. The number of infections occurring in wounds treated by us as primary wounds was 4.8 per cent. The ninety-nine cases include only those which were diagnosed as infections at the time of the first visit. In these are included simple infections of the skin and subepithelium tissues, paronychia, infections of the sub-aponeurotic and subcutaneous spaces, tendon sheath infections, palmar space infections and lymphangitis when limited to the hand and forearm. In the entire series only three varieties of antiseptics were used, boric acid, saline and Dakin solution. I am quite firm in the opinion that there are three things of paramount importance in the treatment of hand infections and these are, drainage, heat and moisture. I believe it makes very little difference what the moisture consists of, boric acid, alcohol, bichloride, potassium permanganate, Ringer's solution, glucose, sterile water or any one of the various solutions which have been used, so long as the strength or character of the solution does not irritate the tissue. Salt solution was used in cases treated at home, as common salt is to be found in every home. This obviates the necessity of explaining to the men about boric acid. The cases treated with salt solution apparently did as well as those treated with boric acid. In an infection which is not serious enough to warrant hospitalization the man is advised to go home and put the hand in a vessel of hot salt solution in the proportion of 1 teaspoonful to a quart of water, leaving it immersed 15 minutes every hour. Between the saline baths he is instructed to wrap several wet towels about the hand and forearm and put the hand on a hot water bag.

Paronychia are treated in the mild and early cases merely by raising the epithelium at the edge of the nail, draining the small collection of pus

and packing in a small bit of gauze, followed by wet dressings. In the more extensive cases an incision is made through the skin parallel to the edge of the nail and extending well below the sulcus of the nail, the triangular flap thus made is raised, the portion of the nail which has been elevated by the pus is removed, care again being taken not to injure the matrix or the epithelial margin at the base of the nail and thus causing subsequent deformity of the nail. Wet dressings are then used and the inflammation and pain then usually subside quite promptly.

There are, according to Kanavel, six fascial spaces in the hand, viz.: the middle palmar, thenar, hypothenar, dorsal aponeurotic, dorsal subcutaneous and lumbrical. Three of these spaces are very important and the other three are relatively unimportant. Each space receives its infection along certain definite routes and each in turn passes the infection along through equally fixed channels.

Infections of the subcutaneous and sub-aponeurotic spaces are to be drained as promptly as the exact location of the pus can be determined. This may necessitate seeing the patient two or three times before incision but also prevents the possibility of making several incisions without finding pus. The localization of these abscesses can be aided by going over the involved area from the periphery to the center with a point or pencil or applicator until the tenderest area is found. In the majority of cases this will quite accurately locate the collection of pus. As to the incision it should be made with the resultant scar in mind and the degree of limitation of function which may result. We have ceased entirely making longitudinal incisions on the palmar surfaces of the fingers, as these result in longitudinal scars which are forced to bend in flexion of the fingers and which are more or less disabling. A great many flexor surface infections of the fingers have been opened by transverse incisions extending completely across the finger. These heal up rapidly and with a minimum of disability and although apparently contrary to the tenets of anatomy seem of practical value. A Mayo scissors is probably the ideal instrument for opening pockets in the hand, especially if there is a sinus in which to insert one blade of the scissors. Even where the skin is unbroken a small opening may be made through the skin and then the scissors used. By cutting the skin carefully with the scissors, using the closed points of

the scissors as a finder, there is less risk of harming important structures than when a knife is used.

I would like to emphasize again the advisability of delaying incision in fascial space infections until one is certain of the location of the abscess. I believe nothing is gained in premature incision made in the hope that benefit will be derived from relief of tension, even if pus is not found. I think no harm was ever done by waiting until a diagnosis can be made. This is in contra-distinction to the incision in synovial sheath infections, which should be made at the earliest possible moment, and in a lymphangitis, in which it should be delayed as long as possible.

As to the anesthetic used I do not believe there is any question. An infection that is of any extent or in an important place that is opened under a local anesthetic is accomplished more by luck than otherwise if done correctly. Nitrous oxide was used in fully 95 per cent of our cases. This or ether gives the operator sufficient time, a quiet field and is not painful to the patient.

Wide incision of the space involved followed by hot boric dressings without the use of drains has been our rule. Rubber tube drains are to be discarded because of the risk of pressure necrosis and a gauze drain soon becomes filled with coagulated secretions and blood, forming a plug which obstructs drainage rather than promotes it. If it is thought necessary to insert some sort of drain to keep the edges of the wound from falling together, thickly vaselined gauze acts very well. The dressing should be changed daily or oftener if the discharge is profuse. Moist dressings are very valuable but should not be used after they have outlived their usefulness as they promote excessive granulations and tend to macerate the tissues, keeping them boggy and soft. After the acute process has been controlled, a dry dressing is all that is necessary if adequate incisions have been made.

Synovial sheath infections are surgically important because of the destruction which occurs, the rapidity with which the process advances and the possibility of rapid spread of the infection if the condition is untreated. A tendon sheath may become infected directly through a crushing injury or laceration or from a slight abrasion or even a prick of a needle. The finger in such case is found to be edematous, both on the flexor surface and the dorsum, the patient complains of tenderness on pressure at all points but it will be found that

firm pressure applied over the tendon itself is quite out of proportion to pressure over the other areas. This extreme tenderness will be found to follow the course of the sheath. On passive extension of the finger the pain is very marked and usually most severe at the proximal phalanx, the finger is held in flexion and this differs from the flexion of a fascial space infection in that motion is much more painful. The three cardinal symptoms then of tendon sheath involvement, are: first, excessive tenderness along the course of the tendon; second, excruciating pain on extension; third, position of flexion. The diagnosis is often fairly easy and can usually be made without difficulty.

Incision should be made down to the distended sheath and then the sheath incised, as far as the infection has extended. The incision may be made at the sides of the fingers and not on the flexor surfaces, one side or both sides of the finger may be incised, and the incision may be continuous, but if possible may be interrupted opposite the middle of the shafts of the phalanges, thus avoiding slings which hold the tendon taut and also preventing prolapse of the tendon. The size of the opening is of prime importance and must be large enough to drain the infected area freely. It is better to have it too large than too small. If the entire finger is involved the proximal and middle phalanges should be opened, incision in the distal phalanx being usually unnecessary. The proximal end of the incision is carried down into the palm according to the amount of palmar involvement. If the lumbrical space is involved the lateral incision is carried down the lumbrical muscle. If this involvement has not occurred, incision is made in the midline over the palmar end of the sheath and extends from the flexion crease at the base of the proximal phalanx about three-fourths of an inch into the palm.

Infections involving the fingers traverse different routes and involve different areas depending upon the finger primarily involved and whether the infection is lymphatic, fascial or through the synovial sheath. Fascial space infection in the index finger may spread dorsally onto the back of the hand, into the webbed space between the first and second fingers or along the lumbrical muscle and thus into the middle palmar space. If the metacarpo-phalangeal joint of the finger is also involved with destruction the flexor space may be involved.

In the thumb fascial infection does not tend toward the thenar space but rather away from it. In the second and third fingers the route lies also toward the dorsum of the hand and toward the mid-palmar space. In the little finger it is uncommon but the infection may burrow into the middle palmar space.

As to the spread of synovial sheath infections: this also varies in the different fingers. In the index finger the pus, having ruptured from the proximal end of the sheath, lies in the loose connective tissue about the lumbrical muscle, along which it extends and finally ruptures through a thin sheet of fascia into the thenar space.

In the invasion of the flexor longus pollicis of the thumb the sheath ruptures, allowing the pus to come to the surface, or it extends down the radial bursa. From here it may find its way into the ulnar bursa through a direct communication which often exists, or by rupture. If the sheath ruptures in its distal part it may thus become a fascial space infection and pass to the thenar space.

In the second finger the extension is to the mid-palmar space and in the third finger the same. In the fourth finger in cases where the sheath connects with the ulnar bursa, this becomes involved. In this finger rupture at the proximal end of the sheath may take place, the pus then reaching either the bursa or the mid-palmar space.

Extension by means of rupture through the ends of the radial and ulnar bursa is the common cause of deep abscesses in the forearm. These may be drained by lateral incisions at the level of the flexor surfaces of the radius and ulna, communicating with one another under the tendon of the flexor profundis.

The importance and value of proper treatment of fascial space and tendon sheath infections, and thus preventing extension to the palmar spaces, is shown by the fact that we had only five cases in

ninety-nine infections in which the palmar spaces were drained. In three cases it was found necessary to amputate a finger either because of hopeless necrosis of tendons, combined with an extensive infection, or of involvement of the bone itself.

In our cases in which the mid-palmar space was drained the incision was made after the technique outlined by Kanavel. An incision is made on the flexor surface of the palm along the lumbrical muscle of the second, third and fourth finger, depending upon where the most marked involvement lies, preferably between the second and third finger. The incision is carried down to the tendons, the forceps is inserted between the tendons and the points spread apart in the space beneath and a small strip of vaseline gauze inserted. To open and drain the thenar space an incision is made opposite the middle of the index metacarpal on a level with its flexor surface.

The after-treatment of fascial space infections consists of hot, moist dressings, together with active and passive motion very early. Following the clearing up of the infection, massage, moist and dry heat and diathermy are very valuable. We have found that these procedures under our personal guidance, or of one trained in physio-therapy, are infinitely more beneficial than when left to the discretion of the patient, who does not realize that the valuable time he is spending waiting for the joints to become less painful, is also being spent in firmly organizing the exudate which later will permanently disable him.

In our burn cases, none of which were very extensive, we used 2 per cent salicaine ointment, which we believe has some anesthetic effect, thus rendering the injury less painful. The saline is used later to keep the tissues soft, remove the crusts and exudate and allow motion with less pain and thus prevent contraction. In two of the burns, grafts were used to hasten epithelialization.

SOME NEW PROBLEMS IN OBSTETRICS*

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The scientific, economic, social and mechanical problems of the day are taxing the skill of the best minds to the extreme. Second to none is the problem of the automobile, which is influencing to no small degree all classes of society. The automobile as a means of transportation is with us to stay and is causing a marked increase in casualties to human life, antepartum as well as to those already on the way to the age of discretion and individual responsibility.

Accidents to intrauterine life and how to prevent them is a problem which daily confronts our profession. We are all asked the question by the antepartum and postpartum mother, "How soon can I ride in a motor car?" and almost as often, "When can I drive one?"

What are the factors incident to the accidents that present for consideration? I have classified them as (a) Mechanical, (b) Physical, and (c) Emotional.

Mechanical Factors.—The mechanical irritations are varied and in many ways cause abortions, miscarriages and premature labor, most often from direct violence to the mother. We have recently noted many more anomalies in the fetal cord, such as complex knots, coils about the neck and fetal extremities and, of much more moment, turns under the axilla over the shoulder and then around the neck, which predispose to strangulation of the cord against the bony parts in the last few moments of the second stage, thus stimulating the fetus to inspire in the lower canal or even causing death from direct strangulation of the cord. These observations have necessitated unusual care and caution in watching the fetal heart during the last of the second stage and in three cases I feel sure this concern saved the life of the fetus in each instance. The pulse becoming slow, irregular and arrhythmical, forceps were immediately applied and delivery hastened, resulting in a living child, which other-

wise would have been lost. I urge all who have not the aid of an assistant to watch the fetal heart-beat, to wear the head stethoscope and use it after every pain during the latter part of the second stage of labor. The three cases above mentioned were all cord complications.

This same mechanical stimulation can cause more abnormal positions and presentations, which always contribute additional hazards to a successful delivery. Again, we may have this factor causing premature rupture of the fetal membranes or premature separation of the placenta, which may be very slight, causing only a mild hemorrhage, contributing to placental infarcts and their complications, or producing any degree of hemorrhage to complete separation.

It has been my experience with these patients who drive motor cars and insist upon doing so up to or near maturity, to have premature or false labor, requiring absolute rest in bed for seven to ten days, in order that the uterine muscle may recover so that the contractions would have some muscular strength and efficiency. One patient in particular who had false pains for three days, with no progress, was put in bed and as long as quiet, would experience no contractions, but the slightest movement, as going to the toilet, would stimulate this irritable, tired muscle to contractions. Rest in bed for five days, use of small doses of morphine and chloral, brought about a recovery of the muscle strength of the uterus. Another test of labor resulted in irregular pains during the second stage, one intermission of one hour without a single contraction, then a precipitate delivery with one good pain. This patient was of special interest, as this was her fourth delivery, the second and third being precipitate following a very short labor.

Physical Factors.—The physical disturbances may not contribute so materially to complications of pregnancy as the mechanical, but still have no small share. Long journeys by motor contribute to general physical tiring, muscular pains, especially backache, particularly riding in the rear seat, which is set on the incline, causing more intra-abdominal pressure on and irritation to the uterus. Inability to empty the bladder and bowel when the call of nature demands is no slight irritation to the physical economy, especially if there be an unusual tendency to constipation or bladder irri-

*Read before the Southern Minnesota Medical Association, Mankato, May, 1924.

tation. Any interference with normal elimination and metabolism in the mother contributes to nutritional impairment in the embryo. Long distance motoring contributes to digestive disturbances in irregularity of meals and inability to secure the proper foods.

Emotional Factors.—Last but not least, is the emotional feature accompanying motoring—for example, riding at night in a storm or on uncertain roads, with apprehension of danger or accidents. I have had two patients abort at the third month of gestation from anxiety and fear attending a trip in a rain storm on slippery roads, without an accident or any mechanical disturbance. Again, sudden emotion on just missing running down an individual or the killing of an animal or fowl along the road is detrimental. Many pregnant women are so sentimental about their condition that they will not inform a driver of their delicate condition in order that more caution in driving be taken.

How are we to educate our patients on these points and impress upon them the gravity of the hazards attending motoring? I have anticipated presenting my patients with printed instructions. I always inquire whether they are accustomed to ride frequently in motor vehicles or whether they drive one. I instruct my patients to absolutely forego riding in a motor vehicle, especially the crowded, rough riding bus, during the first, third, seventh and last months of gestation, to avoid rough or long trips at any time and when riding, to choose the front seat, which has a right angle position and good foot support.

CONCLUSIONS

1. Without question transportation in an automobile very materially increases intrauterine complications of pregnancy and intrauterine death of the fetus.

2. We, as professional advisers and promulgators of prophylactic medicine, are in duty bound to warn our pregnant women of these hazards.

3. By intelligent instruction to our prospective mothers, we can no doubt diminish these accidents.

4. This new hazard, added to the many attendant on the pregnant state, is one that will add mortality and morbidity to the mother as well as the fetus. This subject doubly demands our attention in an effort to reduce the mortality which is still second only to that from tuberculosis.

PNEUMONIA AND ITS TREATMENT WITH PNEUMOCOCCUS ANTIGEN*

DONALD B. PRITCHARD, M.D.
Winona, Minn.

During and following the influenza epidemic of 1918 there has been a very great morbidity from pneumonia and the mortality has been very high. This is my excuse for burdening you with a paper at this time. I confess that I have hesitated to appear before a meeting of medical men to tell them of my experience with the use of pneumococcus antigen in the treatment of pneumonia because of the difficulty in evaluating the results of any form of treatment in this disease. To those who have had no experience with pneumococcus antigen in the treatment of pneumonia it may appear that I either do not know a pneumonia when I see it or that I am greatly exaggerating the results obtained. From October 6, 1918, to May 1, 1924, I cared for 124 cases of pneumonia, all but one of which was more or less thoroughly treated with pneumococcus antigen, a method developed by Dr. E. C. Rosenow.

This antigen consists of a salt solution suspension of partially autolyzed highly virulent pneumococci of the different types. The autolysis under ether at 37° is allowed to proceed until nearly all organisms have become gram negative and suspensions have lost their toxicity as determined by intravenous injection in guinea pigs, and subcutaneous injection in man. The dose for adults consists of 1 c.c. containing twenty billion partially autolyzed organisms, subcutaneously, daily until the temperature becomes normal and remains so for one or two days, or until it is apparent that it has no good effect. Rosenow has shown that the anti-bodies increase more rapidly, the local and constitutional reaction is much less marked than following injection of the ordinary pneumococcus vaccine and that, with the partially autolyzed dead organisms, animals can be protected against otherwise fatal doses of highly virulent pneumococci, if treatment is begun soon after inoculation of the test organisms.

In my review there has been a total mortality of nine, or slightly over 7 per cent, but the death rate tells only a part of the story. Of the 124 cases, forty were twelve years of age or under, eighty-

*Read before the Southern Minnesota Medical Association, Mankato, May, 1924.

four were over twelve, and six of these were over seventy-five years of age. There were fifteen lobar and twenty-four broncho-pneumonias in those of twelve years of age or under, and forty-one lobar and forty-four broncho-pneumonias in those over twelve years of age. Of the lobar pneumonias twenty-nine involved the left lung, fourteen the right lung, and in two cases both lungs. In the remaining eleven patients my notes do not specifically specify the area involved. The broncho-pneumonias were more or less generalized. In some only a comparatively small area was involved while in others it was very extensively scattered over both lungs.

First I will briefly detail the cases that died.

An old nephritic case developed in the afternoon a severe hemorrhagic pneumonitis. When I saw him a short time after, he had crepitation and râles all over both lungs. The temperature was 104.6, pulse and respiration were very rapid, he was decidedly cyanotic, coughing up great quantities of blood. I gave him a dose of pneumococcus antigen but he died in twenty hours.

A man, age thirty-six, weighing considerably over three hundred pounds, 5 feet 9 inches tall, had been sick for three days following a preceding attack of influenza. His temperature was 103, pulse 146, respirations 48, he was very cyanotic, and both lungs were involved in an extensive broncho-pneumonia. I gave him a dose of antigen and in eighteen hours he died.

A girl, age seventeen, with no preceding illness, developed a lobar pneumonia involving the lower lobe of the left lung and in two days after administration of pneumococcus antigen she apparently recovered, her pulse, temperature, and respirations having become normal. Four days later she complained of severe headache, was vomiting, and died of a cerebral meningitis in four days.

Two other patients, an uncle and a niece in the same household, both ill at about the same time with influenza, were attacked with broncho-pneumonia which gradually grew worse as they became intensely cyanosed, and in spite of antigen both died without its seeming to have the slightest effect.

A man of 74 years, who had a hemiplegia of the right side due to an arteriosclerosis and recent cerebral hemorrhage, sickened with broncho-pneumonia, from which he died on the fifth day.

A woman, aged 78, had influenza followed by a

broncho-pneumonia, from which she was apparently quite convalescent in three days. Two days later she developed an acute mania, and died in ten days.

A child, aged 4, seen when she had been ill for several days with a broncho-pneumonia following measles, died on the tenth day after I saw her, showing no response to treatment.

A little girl, aged 8, had been sick with influenza seven days when I called to see another member of the family and before leaving I asked how the little girl was. They said that she was still in bed but that she was better and that they expected she would be up the next day. I went into her room to greet her; her skin was cool and of good color, pulse not over 80, respirations not hurried, and she looked as if there was nothing much the matter with her. As I turned to leave the room, I thought I had better take her temperature, which I did, and to my surprise she had a mouth temperature of 103. I examined her chest and she had an extensive broncho-pneumonia that undoubtedly had been present for some time. On that day my supply of pneumococcus antigen was exhausted but the next morning (they lived some miles in the country) I called to see her. She was then practically pulseless at the wrist, respirations were rapid, she was very dull and apathetic, and cyanosed. I did not administer antigen and she was dead within three hours.

In none of the 124 cases treated did empyema develop, which I think is significant. I have included all the pneumonias seen by me from October 6, 1918, to May 1, 1924, and except the case noted all received more or less antigen. If you will bear with me for a few minutes more I will describe a few of the rather striking results obtained.

I have already spoken of the rather startling result in the first case in which I administered it. In a girl of seven, suffering from a sudden and very acute attack of broncho-pneumonia following influenza, with a very high temperature, rapid pulse, rapid respiration, crepitations, and râles generally distributed throughout the chest, in twelve hours after a dose of antigen the temperature, pulse and respiration had practically attained normal and in twenty-four hours she was convalescent. It is no wonder that I doubted my senses, as this was my first experience with it.

Early in the epidemic one of the pupil nurses

in the hospital came down with influenza and on the morning of the third day her temperature was normal and she seemed to be on the way to convalesce. In the early afternoon they telephoned me that she was very much worse. Her temperature had reached 104.6° , pulse 120, respiration 30, and she was coughing a great deal, raising a bright red sputum, and complaining of sharp pain in the chest, but the physical findings were not very definite. She looked anxious and she was a very sick girl. I at once administered pneumococcus antigen. The next morning she was very much better and there was a definitely dull area with blowing breathing in the lower lobe of the right lung. Another dose of antigen was given. The next morning she was apparently well. I had no more antigen to give her. Two days later she began running a temperature and on the third day she seemed to be as ill as when I first saw her. On the fourth day I gave her another dose of antigen, with results similar to the effect of the first. In two days she was again convalescent. This time she had three doses on successive days and made a prompt recovery.

At about this time I had a young man with a hemorrhagic pneumotitis, who coughed up great quantities of blood. He had been a brewery worker for years and was not a good subject for pneumonia. I gave him two doses, twenty-four hours apart, and as I was again out of antigen he got none until three days later. In the meantime his temperature shot up, his cough and hemorrhages recurred, when I was again able to give him a dose for two days in succession. On the second day after that he began coughing, temperature and pulse went up, which continued for two days, when I was able to give him some more antigen, and this time I continued it for three doses, after which he remained well.

In February, 1921, I saw in consultation with Dr. Scherer, of Duluth, a five year old girl who had been sick with influenza for three or four days, and after being dismissed by the doctor at his morning visit he was called back in the afternoon and found his patient very ill with oncoming broncho-pneumonia. The family telephoned for me and at 9 a. m., the next day, about twenty hours after the onset of the pneumonia, I saw her with Dr. Scherer. She had passed a very bad night, her temperature was high, pulse and respiration rapid, and she was mildly delirious. She had a

well developed and extensive broncho-pneumonia. We administered pneumococcus antigen and at 9 p. m., some twelve hours later, we saw her again, and the record showed that in the early afternoon improvement began and proceeded rapidly, and at this visit her temperature, pulse, respiration had practically reached normal, her nervous condition had become greatly improved, and the further progress was a prompt and uneventful recovery.

This spring I saw two extensive broncho-pneumonias following measles. They promptly subsided so far as the toxemia of the pneumonia went and they were practically over it within 48 hours. One of them, a boy twelve years of age, sick three days with measles, his mouth temperature 105.2° , pulse 170 and not of good quality, respirations ranging from 55 to 60, was extremely cyanotic and the alae of his nose were dilated. He had an extensive broncho-pneumonia throughout both lungs. I gave him 1 c.c. of the antigen and when I saw him the next morning, twenty-four hours later, his color was good. The rectal temperature had dropped to 101.2° , mouth 100, pulse 124, respirations 30, but he seemed to be rather dull and apathetic. The antigen was repeated and he made an uneventful recovery.

There were two other cases of hemorrhagic pneumotitis with unusually severe onset which recovered within forty-eight hours after administration of pneumococcus antigen.

Three years ago a girl, aged four, became ill with a left lower lobe infection. She began quite acutely and twelve hours after her first dose of pneumococcus antigen her temperature, pulse, respirations had reached normal. At my visit the next morning she was as ill as at my first visit. She was given a second dose of antigen and at night the symptoms had markedly abated, but the next morning she had again become as ill as ever. I repeated the antigen and at night, while she had again seemingly recovered, I repeated the dose and for the next two days I gave the injections morning and evening and her recovery was prompt.

Time will not permit the citation of many other cases with seemingly marked beneficial effects.

I am aware that some of these cases might have aborted without pneumococcus antigen, but not with the uniformity that I have experienced. I have been in practice for thirty-seven years and can recall but one case of pneumonia that aborted

in twenty-four hours excepting those treated with the antigen.

In some cases the effect is not so striking and recovery is by gradual daily improvement, extending over six or seven days. Success depends upon early diagnosis and treatment. I would almost as soon care for diphtheria without diphtheria anti-

toxin as to be responsible for pneumonia without pneumococcus antigen, and I have had experience in both diseases with and without these remedial agents. Dr. Rosenow has done much to advance medicine, but I think this product of his brain, while of great value to the practitioner, is the least appreciated of his contributions.

A MEDICAL CENTER IN THE ORIENT

"The visitor to Peking today who has had no warning in advance is surprised to find on the site of what was once the palace of a Chinese prince, a group of beautiful buildings which make a somewhat puzzling impression. At first glance they seem to be of classic Chinese architecture. The curved roofs of glazed tiles, the elaborately decorated eaves, the formal courts, the white marble steps and balustrades, the main gate guarded by archaic lions—all seem characteristically Chinese. But on closer examination other features are noted. The buildings are of brick, two, three, or even four stories high. The windows are large and glazed. Yonder rises a tall chimney evidently belonging to a power-house. Half hidden at one side one recognizes the storage tank of a gas-plant. Here evidently is an institution of the West which has assumed some outer aspects of the East. It is the Peking Union Medical College, built, equipped, and maintained with funds supplied by the Rockefeller Foundation through the China Medical Board.

"In these laboratories, classrooms, and hospital pavilions teaching and research are being carried on in the modern scientific spirit, by well-trained men and women from many parts of the world. The 78 members of the medical school and hospital staffs who hold medical degrees represent 38 medical colleges of 11 different countries. In increasing numbers Chinese scientists and doctors are being welcomed as members of the faculty and advanced to positions of responsibility. In a premedical course students are being prepared to enter the regular undergraduate medical school. A school of nursing is a part of the plan. Graduate students, Chinese physicians, and medical missionaries on furlough from their stations are pursuing special studies or serving as voluntary assistants. From time to time brief intensive courses are organized in medicine, surgery, the clinical specialties, the fundamental laboratory sciences, and roentgenology for groups of doctors who wish to keep abreast of recent progress. Visiting professors from Amer-

ica and Europe have a share in these courses as well as in other teaching, and bring to the institution the stimulus of their ability, experience, personality, and prestige.

"The main scientific and professional aims of the College are: (1) to provide an undergraduate medical training of high standard, (2) to afford facilities to physicians for graduate work, (3) to give special preparation to prospective medical teachers and investigators, (4) to offer opportunities to staff members and advanced students for research, especially with respect to diseases of the Orient, and (5) in various ways to increase popular knowledge of the methods and meaning of modern medicine. The College is a development of an institution founded under missionary auspices. It seeks to perpetuate ideals of high character and loyal service and to work in sympathetic relations with the missionary movement and with the Chinese themselves."—*The Rockefeller Foundation*.

TEN WAYS TO KILL A MEDICAL SOCIETY

Don't go to the meetings.

If you do go, go late.

If the weather doesn't suit you, don't think of going.

If you do attend a meeting, find fault with the work of the officers and members.

Never accept office, as it is easier to criticize than to do things.

Get sore if you are not appointed on committees, but if you are do not attend committee meetings.

If asked by the chairman to give your opinion on some matter, tell him you have nothing to say. After the meeting tell everyone how things should be done.

Do nothing more than absolutely necessary, but when members use their ability to help matters along, howl that the institution is run by a clique.

Hold back your dues, or don't pay at all.

Don't bother about getting new members. "Let George do it."—*Pittsburgh Medical Journal*.

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EDITORIAL

The Pasteurization of Milk

Milk is one of our most valuable and most extensively used foods. It is also a very ready medium through which certain communicable diseases may be spread if measures are not taken to safeguard it. A safe milk supply is now recognized as one of the fundamental requirements in the protection of public health.

The most economical and effective method of rendering milk safe, and the one which is universally recognized, is pasteurization. Health authorities now agree that all market milk should be pasteurized, unless it has been produced and handled under conditions similar to those required for certified milk. Pasteurization should not be counted on to make up for lax or unclean methods of production; its purpose is primarily to overcome certain dangers in raw milk which even the most highly developed systems of dairy inspection may not eliminate.

Milk is pasteurized by heating it to a temperature not lower than 145° F. for not less than thirty minutes, and then promptly cooling it to 50° F.,

or below. Pasteurization under this method does not render the milk sterile, but makes it safe insofar as the transmission of disease is concerned. A number of types of harmless but desirable bacteria which cause milk to sour are not killed by this heating process, so that pasteurized milk sours in the same manner as raw milk, although the time it remains sweet is prolonged about twenty-four hours.

The process of pasteurization as carried out at the present time by the "holding" method causes no appreciable chemical change in the milk; it tastes practically the same as raw milk and the food value is not materially affected.

Milk, unlike any other single food, contains all three vitamins and the effect that pasteurization may have on them is of importance. Fat-soluble vitamin A and water-soluble vitamin B are quite resistant to heat and it is agreed that pasteurization has little or no effect upon them. The antiscorbutic vitamin C is sensitive to heat at about 122° F. While the destruction of this vitamin depends upon the temperature, length, and condition of heating, as well as on the reaction of the material in which it exists, pasteurization of milk undoubtedly weakens the antiscorbutic property of the milk to some extent. It has been found that milk freshly drawn from the cow at certain times of the year does not always contain a sufficient quantity of vitamin C to protect against scurvy. This variation in the vitamin content of the milk is determined by the kind of food which the cow receives. Since even fresh, raw milk may not contain a sufficient quantity of vitamin C, most physicians recommend that this vitamin which is present in orange juice, tomato juice, etc., be added to the diet when cows' milk is substituted for breast milk. In view of the fact that vitamin C must be substituted in the infant's diet regardless of whether or not the milk is pasteurized, a partial destruction of this vitamin resulting from pasteurization is of little practical importance. Since adults do not depend on milk as a source of vitamin C, pasteurization cannot be said to have a detrimental effect on the food value of milk insofar as they are concerned.

In consideration of the protection against disease that proper pasteurization offers, there is no longer any question as to the value of the process from a health point of view. In cities where all of the supply is pasteurized, milk-borne diseases have been practically eliminated. The United

States Department of Agriculture makes the statement that "no epidemic of disease has ever been traced to properly pasteurized milk."

H. A. W.

The State Meeting

For the first time in history our State Association, at its annual convention, is to be the guest of St. Cloud. Until recently it was considered that the hotel facilities of St. Cloud made it impossible to meet there. With the completion of the Breen Hotel this difficulty has been removed, although the local committee expects such a crowd that the hospitality of private homes will have to be accepted. The St. Cloud physicians and, in fact, the residents in general, are apparently going to show what royal entertainment they can extend. Each and every member is urged to do his best to attend.

The St. Cloud convention will afford a good opportunity for our wives to go on a little spree. They are to receive special entertainment and St. Cloud has some interesting activities worth seeing, for instance, the granite quarries, paper mill and State reformatory. And then there is golf.

A perusal of the scientific program which appears elsewhere in this issue should convince one that the program committee has arranged something which promises to be worth going to St. Cloud to hear. Of course, the addresses are to be published later, but reading a journal is not a good substitute for meeting your professional friends and holding those informal professional discussions which are so valuable.

The innovation of publishing the committee recommendations in advance of the meeting has been carried out this year and the reports appear in this issue. The advisability of attempting to establish a state medical library is brought up in an editorial. The suggestion has been made to the secretary of the Association that we establish a fund for the financial assistance of the needy ones in our ranks, particularly the aged and incapacitated. There is much to recommend such a step. These matters should receive the consideration of members and particularly the delegates in advance of the meeting, so think them over.

The absence of two of our prominent members is going to detract from our full enjoyment of the meeting. The illness of our president, Dr. Archibald MacLaren, will prevent his attending and presiding at our sessions. We shall all miss him

greatly and sincerely hope for his speedy recovery. It is more than to be regretted that Dr. Beebe, who has played such a prominent part in the medical life of our Association and who was responsible for the choice of St. Cloud for this year's convention, will not be there to greet us.

Dr. E. T. Sanderson, our first vice president, expects to be present at St. Cloud and will preside.

Till we meet in St. Cloud, then!

A State Medical Library

Several of the larger county medical societies have medical libraries for the use of their members. Perhaps 50 per cent of the physicians in the state, however, are without the use of a first-class library. They must depend upon the few books and periodicals they have individually been able to get together. This is a distinct disadvantage when it comes to keeping up with medical progress or preparing medical papers.

There is a medical library, state supported to be sure, at the University. Recently it has been fused with the biology and dentistry libraries to form a department of about 50,000 volumes in the University library. During the summer the medical books were transferred to the new University library building which, by the way, is a magnificent structure. The University library is admittedly for the use primarily of the faculty and secondarily of the students of the University. No provision has been made for the loan of books to outside individuals. Possibly, however, if a demand for a circulation department of the medical library were shown, this could be obtained with little effort.

Circulatory medical libraries do exist. That of the Medical Society of the County of Kings in Brooklyn and that of the College of Physicians and Surgeons in Philadelphia are notable examples. The Surgeon General's library in Washington loans medical literature extensively, but only through a reliable organization such as a county society library.

New York has maintained a state medical library at Albany for many years. Three years ago a medical branch of the Iowa State library was established with its own librarian and quarters in the Historical Society Building at Des Moines. This latter may well serve as an example of the need and practicability of such an institution. Ten years ago the State librarian in Iowa, convinced

of the need of medical books in the State library, began to accumulate a few volumes. In 1920 the General Assembly of Iowa created a medical department. A small appropriation is made each year for a librarian's salary and the purchase of books and periodicals. Assisted by contributions from various sources, the library now has some 5,000 volumes. It is reported that 10 per cent of the profession outside of Des Moines and 5 per cent of the profession in the city use the library. This percentage will doubtless increase as the library becomes better established.

Our State maintains a library of some 90,000 volumes at the State Capitol for the law profession. It is worth while for the State to furnish facilities for self betterment to the lawyers. Why does not the same apply to the medical profession? A lawyer can go to the state house and camp in the library. A physician, in most instances, could not and the service of a medical library would be largely through the loan of literature.

Iowa has a state medical library; why not Minnesota? The time is propitious to take up the matter at our state medical meeting this month and provide for a thorough investigation of the proposition.

COMMITTEE REPORTS

The following reports have been submitted by the chairmen of the respective committees and are published for the consideration of the members of the Association and particularly the delegates, in advance of the annual meeting:

COMMITTEE ON MEDICAL EDUCATION AND HOSPITALS

To the President and House of Delegates of the Minnesota State Medical Society:

Gentlemen: Your Committee on Medical Education and Hospitals has the honor of submitting the following report:
FIRST: HOSPITALS:

In its work of raising the standards of hospitals the Council on Medical Education and Hospitals of the American Medical Association has adopted the plan of publishing a list of hospitals approved by it for the training of interns.

In addition to an investigation of each hospital by a representative of the Council from the home office at Chicago, the Committee on Medical Education and Hospitals of the state in which any hospital applying for approval is located is asked to make an independent investigation and report to the Council. Your Committee was requested to make one such survey during the year, namely, of the New Asbury Hospital of Minneapolis. The survey was made and the hospital recommended for approval by the Council. Seventeen hospitals in Minnesota are now approved for the training of interns.

SECOND: MEDICAL EDUCATION:

The Committee on Medical Education and Hospitals of last year, headed by Dr. Braasch, made a very comprehensive and valuable report on both undergraduate and graduate medical education in Minnesota.

Your present Committee will therefore not go into any detail concerning the present status of medical education in the state, but will first take up the recommendations of Dr. Braasch's Committee to see whether or not the profession of the state has profited by those wise proposals. Too often recommendations of Committees which have spent valuable time and concentrated effort on their work are literally thrown into the waste basket by the hackneyed motion "I move the report of the Committee be accepted and placed on file." Therefore, your present Committee makes but one recommendation with the hope that the Committee next year will be instructed to concentrate all its efforts on education to be carried to the physician in his own locality.

The recommendation of Dr. Braasch's Committee:

"That the University of Minnesota offer several courses of instruction at different periods of the year and possibly in a more concentrated form" has been carried out by the University.

In the spring, for two weeks, courses were offered "in a more concentrated form" in Medicine and Surgery, and in the fall for another two weeks in Pediatrics and Obstetrics and Gynecology, together with a one week's course in x-ray diagnosis, laboratory clinical and pathological diagnostic methods.

Another recommendation of last year's Committee was:

"That a system of graduate medical instruction be given by competent instructors in various portions of the state enabling the general practitioner to become familiar with recent medical progress." This has been taken up by your present Committee, which begs leave to make the following report of its investigations with recommendations for putting it into effect: Certain states, notably Wisconsin and North Carolina have undertaken to take instruction to the practitioner. Time and space will not permit a detailed description of this work but the essential features of the plan are these:

Wisconsin. "The purpose of the courses offered in post-graduate medical instruction is to provide physicians, residing in a given locality, with practical demonstrations of the newer methods of diagnosing and treating disease. Clinics are held at a hospital conveniently located, illustrated lectures are given, and opportunity is offered for consultations with specialists. Arrangements may be made for a single clinic and lecture or for a series of weekly, bi-weekly, or monthly clinics and lectures. Arrangements for these clinics and lectures are made through co-operation between the local physicians under whose auspices the clinics and lectures are held and the Dean of the University Extension Division. Physicians enrolling for the course are charged a fee sufficient to cover part of the overhead expenses, the balance is paid from the small appropriation made for this work by the state legislature. The following courses, each consisting of one clinic and one lecture, are offered:

Internal medicine, radiology, pediatrics, dermatology and

syphilis, neurology and psychiatry, genito-urinary diseases, orthopedics, laboratory diagnosis; diseases of the eye, ear, nose and throat; obstetrics and gynecology.

The courses are given by teachers from the University of Wisconsin and prominent professional men of the state.

In addition to these courses obstetrical films are exhibited and the cancer propaganda is conducted in harmony with the above courses by a committee of the State Medical Society of Wisconsin, illustrated by 125 slides.

North Carolina. In this state the work is also conducted by the University Extension Division.

Mr. Chester D. Snell, Director of the Extension work in a letter to Mr. R. R. Price, Director of the same work at the University of Minnesota, says:

"I should like to make it clear that the work which we are offering is regular post-graduate medical instruction, and is not devoted to clinics alone. Each class meeting last summer lasted about three hours, of which an hour and a half, approximately, was devoted to a lecture by the instructor and the rest of the time was taken up by clinical work. Some of the meetings lasted a whole afternoon when the classes got interested in the clinical work.

"We ran two circuits of six towns each last summer, and the total attendance in each circuit was one hundred each, or an average of seventeen in each group or class. This next summer we expect to run at least six circuits, and hope to have practically all the general practitioners in this state taking the work.

"Let me say that as far as we are able to judge, this work has been a tremendous success in this state, and we believe we have found a solution of the problem of how to give busy doctors post-graduate medical instruction without great expense or loss of time to them.

"The plan is briefly this: The University Extension Division, in co-operation with the Dean of the Medical School, serve in an organizing capacity. The best available instructor in the country is secured to give the course. Between ten and twenty physicians are assembled at five or six conveniently located towns accessible to the instructor on one day each week for twelve weeks. Each meeting consists of a one-hour lecture and from one to two hours of clinical work. Each group therefore receives a total of twelve lectures and twelve clinical demonstrations. The cost to each person is guaranteed to be not more than thirty dollars. Should the total receipts exceed the cost, the excess will be refunded pro rata.

"Post-graduate medical education is a necessity because of the rapid advancement in medical science. The average general practitioner cannot afford to be absent from his practice six weeks in order to take a course in residence at a cost of \$400 or \$500. What is now known as the 'North Carolina Plan' was inaugurated in the summer of 1916.

"Two instructors were appointed. Each was assigned to a circuit of six centers, which he covered in rotation every week for four months, a class thus being held in each city once a week. The classes were composed of physicians residing in these centers and their surrounding rural communities.

"The actual organization of the classes, and the planning of the instructors' routes and other executive work was

carried out by the University Extension Division, while the more strictly medical problems, notably the selection of the instructors and the outline of the work, were in the hands of the Dean of the Medical School."

The experiment in these two and other states has been very successful. Your Committee believes that the profession of this state will welcome an opportunity to broaden its knowledge and to keep up with medical progress which some such plan will furnish at a minimum expenditure of time and at a reasonable cost.

Therefore, your Committee recommends:

1. That the Committee on Medical Education and Hospitals be instructed to confer with Mr. Richard R. Price, Director of the Extension Division, and Dean Lyon of the Medical School, as to the feasibility of the scheme. (Mr. Price and Dean Lyon have expressed to the Committee their willingness to co-operate with the State Medical Society in every possible way.)

2. If found to be practicable to adopt a plan suitable to the peculiar conditions in Minnesota and

3. Subject to the approval of the Council to put the plan into effect in co-operation with the Director of the Extension Division and the Dean of the Medical School of the University of Minnesota.

4. Finally, your Committee believes that the plan can be made self-supporting, but it realizes that in inaugurating any new scheme there may be some incidental expenses necessary, we therefore recommend that a small appropriation be made to insure success.

Respectfully submitted,

A. R. COLVIN.

E. S. JUDD.

J. C. LITZENBERG, Chairman.

COMMITTEE ON PUBLIC POLICY AND LEGISLATION

To the President and Members of the House of Delegates of the Minnesota State Medical Association.

Gentlemen: Owing to the fact that the Legislature of the State of Minnesota was not in session during 1924, the activities of your Committee on Public Policy and Legislation has been necessarily limited. We have co-operated with your Committee on Public Health and heartily endorse the recommendations made in their report.

During the sessions of the Legislature of the State of New York we received almost daily bulletins covering the activities of the Committee on Legislation of the Medical Society of the State of New York.

It would seem from these reports that this Society maintains an office at Albany and has a full time man covering the legislature during the entire session. Whether this is feasible in Minnesota or not your Committee does not know, but the subject is worthy of consideration. Telegrams were sent to Governor Smith and Senate Majority Leader James M. Walker at Albany, at the request of Dr. James M. Vanderveer, the Chairman of the Legislative Committee of the New York Society, in the name of this Association, urging the passage of bills relating to the practice of the cults.

A request was received from Dr. W. C. Woodward, Executive Secretary of the Bureau of Legal Medicine and Legislation, of the American Medical Association, request-

ing a transcript of the evidence in a suit brought to test the constitutionality of the Chiropractic law in Minnesota. Interviews with Judge H. D. Dickinson, of Minneapolis, before whom the case was heard, and with Attorney General Hilton, disclosed the fact that there was nothing of value in the evidence and Dr. Woodward was so informed.

Letters have been mailed to the chairmen of the Legislative committees of all County Societies, or to the Presidents or Secretaries of these component Societies, urging them to get in touch with the various aspirants for legislative honors and urge upon them the advisability of informing themselves on medical legislation and to point out to them before they are elected, the necessity for proper regulation of the practice of medicine and surgery.

It is recommended—first, that if possible a full time man be employed during the legislative session, and second, that if any definite legislation is desired by this Association it be formulated at this session and put before the prospective candidates.

COMMITTEE ON PUBLIC POLICY AND LEGISLATION.

THE STATE CANCER COMMITTEE

To the President and House of Delegates of the Minnesota State Medical Society:

Your Cancer Committee begs to submit the report of its activities during the past year.

A review of the discussion precipitated by the report of this Committee at the meeting of the House of Delegates on the first day of the State Society meeting in 1923 presents an interest in the subject of cancer control manifested for the first time. This discussion in itself has served as a stimulus to all members of the Committee to continue in behalf of the State Medical Society the conduct of the educational work as outlined and directed by the American Society for the Control of Cancer.

The constructive criticism offered after the presentation of the 1923 report has resulted in the coalition of the Cancer Committee of the State Medical Society and the State Cancer Committee of the American Society for the Control of Cancer, which enables the Committee to carry on the activities of cancer control under the direction of the State Medical Society. As a result, the activities of this Committee have been conducted in the past year with increasing harmony in the membership of the State Medical Society. As stated in previous reports, it has been the opinion of the State Cancer Committee that it could best serve the interests of the State Medical Society by co-operating with the American Society for the Control of Cancer in its educational campaigns.

The campaign, as outlined in previous years, was again conducted in Minnesota throughout the week of November eleventh to eighteenth in 1923. During that week statewide publicity was given the most salient facts about cancer, through the organization and activities of seventy-six County Cancer Committees. Through these organizations short talks were given, and literature, furnished by the National Society, was read before many audiences, including churches, fraternal organizations, clubs, et cetera. Thirty-one public meetings were held under the auspices of County and District Medical Societies. The newspapers throughout the state contributed liberally of space for

articles dealing with the known facts about cancer, furnished by the National Society. Other activities consisted of five cancer clinics, two radio talks, the showing of the film "The Reward of Courage," and slides in many theaters.

Your Committee believes that educational work should continue and desires the co-operation of the individual members of the State Medical Society. Also, the Committee wishes to follow the suggestions of the House of Delegates in the conduct of its work.

We desire at this time to express our thanks and appreciation to the members of the State Medical Society who have been active in the educational campaigns, particularly those who have acted as County Chairmen, and those who have contributed their time and money in the presentation of public lectures.

Respectfully submitted,

VERNE C. HUNT (Chairman),
Minnesota State Cancer Committee.

REPORT OF THE STATEWIDE PUBLICITY COMMITTEE*

This Committee has been comparatively inactive during the past year.

"The Northwestern Health Journal," which was fostered by the Minnesota Public Health Association and this Committee, is prospering and has an ever increasing list of lay subscribers. The material in the Journal is very high class and is designed to reach the ordinary reading public.

"The Popular Health" is a new magazine now being published by the former editor of the Northwestern Health Journal, and is very much the same type of journal. It is at present in no way sponsored by any medical society or medical group, but the material is being submitted by the editor to various medical men, who are members of this society, and is uniformly good. The editor is anxious to have a committee from the State Association officially censor the material and the advertising in the magazine. This magazine is rapidly reaching a wide circulation,—the editor informs now something over 15,000. It has been sponsored by the dentists of the state to the extent that they are all subscribers, and the dental material is being carefully censored by a group of dentists.

Among other publicity activities of the Committee was the radio broadcasting program. After consultation with the president, Dr. MacLaren, and the counselors, an agreement was entered into with the Dayton Company for the broadcasting of a program of popular medical topics. The program was prepared and the topics were to be given out as under the auspices of the State Medical Society, naming also the County Medical Society of which the man who prepared the talk was a member. In our agreement with the Dayton Company, there were to be no names mentioned, the talk simply being sponsored by the State and County Societies. Owing to suspension of operation by the Dayton Company and the WLAG broadcasting station, the program was not carried out. The Committee would like to know, at this time, the sentiment of the Society on the propriety, the feasibility and value of such a broadcasting

*Inasmuch as this report has not been submitted to the individual members of the committee it is requested by its chairman that any objections or suggestions on the part of committee members be presented to the chairman prior to the meeting.

program. While no advances have been made, it is possible that the new, large broadcasting station, now in the process of construction by the Washburn-Crosby Company, could be induced to give us a place on their program. If the program had been carried out, as intended, the outlines for the various talks would have been submitted to the members of this Society throughout the state,—they being asked to write a popular article on the subject which would either be broadcast from the station by the author or a substitute when the author could not be present. The author's name would not be mentioned, but the article would be published in the state medical journals giving credit to the man who prepared the article.

The Committee was also interested with the Public Health Committee of this Society in promoting interest in the State Fair Health exhibitions. We believe by the showing of a little interest that the whole health program of the State Fair could be put under the auspices of the State Medical Society and the University Medical school, and that it would be a very fine form of publicity and public health work for the Society.

As the publicity work of the Society must largely be carried on under the guise of public health, there is an overlapping duplication in the existence of two committees such as we now have.—the Public Health Committee and the Statewide Publicity Committee. Therefore, it is the desire of the Statewide Publicity Committee that this Committee be discontinued as a separate committee and be continued as part of the Public Health Committee.

N. O. PEARCE, M.D.,

Chairman, Statewide Publicity Committee.

COMMITTEE ON PUBLIC HEALTH

In response to a letter from the chairman of the Statewide Publicity Committee, your committee on April 15, 1924, met with Dean Nicholson and the director of the University Public Health service and the vice president of the Hennepin County Medical Society, to investigate the Public Health Service of the University of Minnesota.

The following statements were made by representatives of the Public Health Service. About 60 per cent of the University students are putting themselves through college, either in whole or in part. Ninety per cent of those who report to the staff would probably not see any physician if it were not for the public health service.

The public health service refers a great many students together with their findings to their family physicians when they live in the Twin Cities, and their policy is to do this in those cases where they feel they are able to pay ordinary fees. They admit that the occasional case able to pay ordinary fees occasionally slips by them, but of what free institution is this not true?

In the judgment of your committee the great work they are doing is that of educating these young people to the value of regular examinations, to the value of reporting themselves early in case of sickness and, last but not least, the thousands of students are graduated educated to the value of regular medicine rather than being advocates of the cults.

As to the good accomplished among the student body there is no question. This is detailed in the April issue this year of MINNESOTA MEDICINE.

Your committee wishes to go on record as heartily indorsing the University Public Health Service.

For the first time the State Medical Association in conjunction with the University of Minnesota has put on a health exhibit at the State Fair. Dr. Wm. O'Brien of the Medical Department has had charge of the work and the medical association has paid the bills. The general scheme was outlined in the September issue of MINNESOTA MEDICINE.

At the 1923 session of the house of delegates, the committee on public health for this year was requested to gather information throughout the United States relative to the points of contact between the medical profession and the public. Forty-nine questionnaires were sent and thirty-three responded. Including Minnesota, we have statistics from thirty-four states.

No. 1. Does legislation initiated by the medical profession meet with a fair degree of co-operation in your state or the reverse?

Excellent, 6 per cent; good, 14 per cent; fair, 40 per cent; poor, 40 per cent.

No. 2. Are the medical men of your state organized into legislative committees with reference to proposed legislation?

In 9 states, special organizations; in 24 states, handled by the state committee; in 1 state, no organization.

No. 3. Does your State Association or public health agency publish a journal devoted to medical and public health matters for the laity?

Six states do this, including Minnesota, and one state has a tuberculosis journal.

No. 4. Does your State Association or any component medical society approve or conduct systematic radio talks?

Kentucky, Ohio, Washington (state), Pennsylvania and Wisconsin do this. Approval of the idea expressed by Georgia, Iowa, Texas, Nevada. Minnesota hopes to begin such a program this fall.

No. 5. Have you a public health league or similar organization which develops contact between the profession and the public?

Fifteen states have, including Minnesota.

No. 6. Have you a state hospital for medical and surgical cases and if not through what channels are the poor in your rural communities cared for?

Twelve, including Minnesota, answer yes. Sixteen provide community care only. Six have an insane hospital or none.

No. 7. Are your hospital facilities for indigent tuberculous cases ample?

Yes, 10; fair, 10; no, 10. No tuberculous cases requiring hospitals, 2.

No. 8. Grouping together osteopaths and chiropractors, what is their percentage to medical men?

Unknown, 7. The balance of the states run all the way from 3 per cent to 50 per cent in Wisconsin. In Minnesota the proportion is about 20 per cent.

No. 9. What are your state activities along the lines of child welfare?

Every state that answered is active in this line.

No. 10. Any other information showing points of contact between the medical profession and the public would be greatly appreciated.

Five states have lecture programs; one state offers occasional lectures, and one gives state clinics. Kentucky, Georgia and Wisconsin have systematic public press articles.

If we analyze conditions in Minnesota from the standpoint of contact between the medical profession and the laity we find some satisfactory conditions as well as the reverse. Co-operation on the part of the state legislature is very far from what we could desire. Local county society legislative committees were organized two to three years ago and should be continued. The committee on legislation of the state association is helpless without general co-operation throughout the state. These committees should be active in the pre-election period.

We find two lay journals in Minnesota devoted to public health matters—one published by the Minnesota Public Health Association—the Northwest Health Journal, with a subscription list of over 10,000. This journal deserves the support of every physician in the state and should be in every doctor's waiting room. The second journal is the Popular Health Magazine, which is privately owned and exists for private gain.

The Minnesota Public Health Association deserves more than passing comment.

In 1903, the Minnesota Anti-Tuberculosis Association was organized. In 1907 they had a paid executive secretary. In 1915 the name was changed to the Minnesota Public Health Association. It is financed entirely through the sale of Christmas seals and this income this year was over \$100,000. Their activities include:

Clinics, tuberculosis, pediatrics and public health.

Tuberculosis clinics are conducted by county sanatoria men.

Pediatric clinics by specialists whose expenses are paid by the association. The public health clinic consists of a doctor and nurse who travel over the state in a Ford truck provided the counties have sold enough Christmas seals to pay expenses.

Four public health nurses were in the field this summer.

Health exhibits are loaned as occasion demands. They try and have them at local county fairs as well as at the state fair. They also send a health clown to these fairs.

Dr. Lohead will give health lectures anywhere in the state.

They distribute much public health literature free of charge. They publish at a loss the Northwestern Health Journal, with a circulation of over 10,000.

The matter of radio broadcasting in Minnesota on public health matters by the medical profession has been a storm center of discussion. The consensus of opinion is that the name of the speaker shall not be announced unless he is a full time teacher or public health worker and not engaged

in the active practice of medicine. Your committee is convinced that to allow a relatively small number of active practitioners, whose names are announced over the radio, to broadcast public health talks, would create bad feeling and is not good policy. Five states or county societies broadcast public health talks and four states expressed approval of the plan. Your committee warmly endorses the plan if properly safeguarded. The two stations in Minneapolis have discontinued, but if either of them reopens, broadcasting will probably be done under the auspices of the State-wide Publicity Committee. There are in our state 128 nurses doing public health work exclusive of the Twin Cities and Duluth. There are forty-six county nurses and thirty-seven counties have no nurse. These nurses are paid by various agencies—the local county commissioners, school boards, Red Cross or Minnesota Public Health Association. Olmstead county has a county health nurse, infant welfare nurse, a county maternity nurse, and a school nurse.

Thirty-seven counties of the state support fourteen county tuberculosis sanatoria. This is in addition to Walker.

Minnesota is one of the twelve states out of thirty-four which are equipped to care for the indigent sick, both general and tuberculous.

Some interesting features of work along these lines have been worked out in other states. The Ohio public health association is the chief medium of contact between the profession and the laity. In addition, they have a public health federation including dentists, druggists, nurses, hospitals, the public health association and physicians.

In Kentucky the county medical societies work in close co-operation with the Bureau of Child Hygiene and the State Board of Health. All local clinics are under supervision of the county medical societies. The State Medical Association and the State Board of Health are closely co-ordinated. The State Health Officer is the Secretary of the State Medical Association, and therefore the state association guides the activities of the State Board of Health, which is the legal arm of the profession and is so recognized by the legislature and the public.

In Colorado the Denver City and County Medical Society conducts monthly public health lectures. They have a Colorado association for the protection of public health composed of many prominent laymen as well as doctors.

Massachusetts: "It is only a few months ago that our society first took up this matter of contact between the profession and the public and we have spent most of our time investigating the possibilities. So far we are depending upon lectures which we insist shall be constructive, not argumentative, and the block material for the county newspapers. We are making contact through parent-teachers' associations, women's clubs, labor unions and any place where they may want a lecturer. Each district society is asked to hold an occasional meeting in their district."

In Georgia they have a statewide health association composed of the state chamber of commerce, bankers, railroads and the medical profession. Also a state health council composed of medical associations, Red Cross, the tuberculosis association, Kiwanians, Rotarians, women's clubs, state agricultural society and physical education association.

Texas: The medical profession is raising a considerable

sum of money for a publicity campaign in order to gain public and legislative support.

From a study of the answers received, one is impressed with the general recognition of the idea of the advisability of our profession developing contact with the public along public health lines. The basic underlying principle is to strive for an intelligent public viewpoint toward the medical profession.

Individual members of your committee have repeatedly had the idea of effort along these lines held up to ridicule by the high grade medical men. They say that we are not in a position to do anything as long as we harbor crooks and abortionists and ignorant doctors in our medical societies and allow them to practice medicine.

They say get rid of them first and we can present a clean front to the public and propaganda will not be necessary. Then they add, "How are we going to do it?"

Such types exist in all professions. Your committee believes that the same principle that governs in the acceptance of a life insurance applicant, namely, a confidential report on the moral hazard involved, should also govern in the selection of candidates by the medical schools—namely, a confidential report on character. Those who cannot measure up to established standards should be rejected.

However, if we allow the public to rate the entire medical profession by its relatively few crooks we commit a gross injustice to ourselves.

RECOMMENDATIONS

(1) That local committees on legislation be continued in every county society in the state.

(2) That local committees on public health in every county society take an active interest in all local public health matters.

(3) That radio broadcasting on public health matters be undertaken as soon as possible under the auspices of the statewide publicity committee—that such talks be announced as being given under the auspices of the Minnesota State Medical Association and the _____ County Medical Society, but that the name of the speaker shall not be announced if he is engaged in the active practice of medicine.

(4) That the Minnesota Public Health Association be asked to broaden the scope of their work to include the sending of selected articles on public health to the newspapers of the state at regular intervals and to obtain the newspapers' co-operation for their publication.

(5) That the association indorse the Northwestern Health Journal and permit the management to state that it is the official journal for the public of the Minnesota State Medical Association.

(6) That the Secretary of the Minnesota State Medical Association transmit to the Board of Regents of the University of Minnesota, the recommendation of their house of delegates that in addition to educational requirements to the medical school that the character of applicants for admission be ascertained by confidential reports and that those not measuring up to a proper standard be rejected.

(7) That the state medical association continue their part in the State Fair Public Health Exhibit.

COMMUNICATIONS

Kansas City, Mo.,

August 30, 1924.

DEAR EDITOR:

A nationwide movement for improved conditions in maternal welfare is being inaugurated through the combined efforts of a joint committee representing the American Gynecological Society, the American Child Health Association, and the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons.

An appeal is being made to the Secretaries of the State Medical Associations to enlist the co-operation of their members and also of the constituent County Medical Societies to stress the subject of obstetrics in the programs of their meetings and try to have more papers and discussions on the topics vital to this most essential branch of our work.

The reason for the propaganda is that recent statistics are published showing a deplorably high mortality in maternity work in our country. A Washington report gives the United States the unenviable position of third from the highest death rate in both sepsis and eclampsia among the seventeen civilized nations of the world. These two accidents are almost absolutely preventable. Among the reports from sections where pre-natal care is taught and where aseptic care observed in labor the mortality is reduced one-third to one-half the average in the same region.

So many other features, while not so tragic, demand reform in obstetrics that the committee hopes within five years that not only the mortality of mothers and children may be reduced just as the profession has cut down the death rate in typhoid fever, tuberculosis and diphtheria in recent decades; but also that obstetrics may be again placed on the plane with internal medicine and surgery, a dignity which it formerly occupied in the colleges and in the profession, as one of the three great branches of the healing art.

This is a work of education, and it demands the co-operation of teachers and specialists in obstetrics, general practitioners, nurses, and the general public, to accomplish so ambitious a program.

A copy of the Annual Report to the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons is sent under separate cover detailing some of the conditions found and showing the more hopeful outlook for the future.

(Signed)

FRED L. ADAIR, M.D., Minneapolis.

HENRY SCHWARZ, M. D., St. Louis.

ROBERT L. DENORMANDIE, M.D., Boston.

GEO. W. KOSMAK, M.D., New York.

FRANK W. LYNCH, M.D., San Francisco

RALPH W. LOBENSTINE, M.D., New York.

WM. CLARK DANFORTH, M.D., Evanston, Ill.

GEO. CLARK MOSHER, M.D., Kansas City, Mo.

OBITUARY

DR. JAMES B. WHITE

Dr. James B. White, of Belle Plaine, Minnesota, died at the age of 60 years at the Miller hospital, St. Paul, Saturday morning, August 30, 1924, following an illness of several weeks' duration.

James B. White was born in New York City on August 6th, 1864. When a child of three years his father died and shortly afterward the family moved to Belle Plaine. He grew to manhood in that locality and for a few terms taught school. He later entered the medical school at the University of Minnesota, from which institution he graduated in 1891. The same year he moved to Montgomery to practice medicine. He remained there until October, 1901, when he went to Faribault and specialized in surgery. In the spring of 1906 he again returned to Montgomery and followed his profession until February, 1912, when he returned to his early home in Belle Plaine.

He is survived by his wife, two sons, Robert, of Duluth, and Frank, of St. Paul, two sisters, Mrs. Dennis Connelly, of St. Thomas, and Mrs. H. B. Conlon, of Belle Plaine. Two stepbrothers, M. O'Brien, of Belle Plaine, and John O'Brien, of St. Paul, also survive.

The following tribute is paid Doctor White in the columns of a home paper:

"Doctor White was not only one of our leading physicians but was almost a native son, having come to Belle Plaine in his early childhood. He was widely known through Scott, LeSueur and Rice Counties. He stood high in his profession as a conscientious physician and high in the community as an exemplary citizen. During his practice of more than thirty years he alleviated pain for hundreds and stayed the approach of the Grim Reaper in many homes, yet was fated to go himself when little past the meridian of life. He was of that splendid type of country doctor that responded to every call to rich and poor alike, in every kind of weather, under every adverse condition."

DR. ROBERT H. MULLIN

Notice has been received of the death of Dr. Robert Hyndman Mullin, formerly Associate Professor of Pathology and Bacteriology, Medical School, University of Minnesota, and Director, Laboratory Division, Minnesota State Board of Health.

Dr. Mullin has resided in Vancouver, British Columbia, for several years. He was pathologist for Vancouver General Hospital and connected with the University of British Columbia.

Death was sudden, from cerebral hemorrhage, and occurred at his home, 821 Broughton Street, Friday, August 29, 1924.

DR. JOHN C. NELSON

Few men in our profession have enjoyed to such an extent the esteem, both of his professional brethren and the laity, as did Doctor John C. Nelson. Dr. Nelson was one of the most thorough and ardent Americans the writer has ever known. It was almost dangerous for one to laud this country's enemies or speak disparagingly of any of its institutions within his hearing. Although he was knighted by the King of Denmark for his efforts in behalf of the people from the land of his birth, this recognition should properly have come from us as all his efforts were bent toward educating these foreign born future citizens of the United States in the precepts of pure Americanism.

Dr. Nelson's life is a perfect example for a foreign-born boy landing on the shores of this country to follow. He was a well-educated competent physician, devoted to his work and a man who always had time to accept many times more than his share of the responsibility incumbent upon citizens of this nation and members of this community.

Dr. Nelson was born in Copenhagen in 1847. He came to this country when he was 18 years of age, with his brother and a boyhood chum. He had heard of a Danish settlement at Beloit, Wisconsin, and he came directly from New York to this community. He stayed there but a short time when he went to Fillmore county, Minnesota, working as a clerk in small villages and finally becoming a drug clerk in the town of Lanesboro, Fillmore county. While at this work he became interested in the practice of medicine and began his studies in the Keokuk Medical College. He came to St. Paul in 1879 where he began to practice. Dr. Nelson was coroner of Ramsey county during the years from 1896 to 1900, having served two terms. He had been Danish Vice Consul for this district for the 28 years previous to his death, which occurred March 3, 1924. He had been the examiner for the Aetna Life Insurance Company for 30 years previous to his death. About ten years ago he was knighted in the Order of Dannebrog by the King of Denmark for faithful and efficient service as Danish Vice Consul in this country. Before Dr. Nelson's death he was the second oldest Scottish Rite Mason in the State of Minnesota. He was a member of Damascus Commandery of the Knights Templar, and Osman Temple of the Shrine. He was the first president of the St. Paul Cycle Path Association and for many years was an ardent devotee of bicycling. He was also the first president of the St. Paul Garden Club and was one of our leading amateur authorities on horticulture.

Fifty-two years ago Dr. Nelson was married to Hansina Jensen. He is survived by his widow; three sons and one daughter, Dr. M. O. Nelson, Dr. Louis A. Nelson, Dr. Edgar E. Nelson, and Miss Anna Nelson.

H. B. ZIMMERMAN, M.D.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA STATE MEDICAL MEETING

The annual meeting of the Minnesota State Medical Association will take place in St. Cloud, Wednesday, Thursday and Friday, October 8, 9 and 10, 1924. A program has been mailed to each member.

The Council meets at 10 A. M. and the House of Delegates at 2 P. M. on October 8, in the Knights of Columbus quarters adjoining the Breen Hotel. The second meeting of the House of Delegates will be on the second day, October 9, instead of on the last day of the convention, as formerly. All information can be obtained at the Breen Hotel, which is to be headquarters.

The scientific program begins Thursday, October 9, at 8:30 A. M., the Surgical section meeting in the Sherman Theatre and the Medical Section in the Knights of Columbus Hall, both adjoining the Breen Hotel. The General Sessions will meet in the Sherman Theatre each afternoon at 2 P. M.

Physicians are particularly urged to bring their ladies for the entertainment of whom special efforts have been made. Auto rides through the quarries and to the paper mills and State reformatory and opportunities for golf will be provided. The dance Thursday evening will hardly be a success unless the ladies attend. There will be no wall flowers at St. Cloud.

Dr. C. B. Lewis is general chairman of the local committees on arrangements.

Officers of the Association are:

President—Archibald MacLaren, M.D., St. Paul
First Vice President—E. T. Sanderson, M.D., Minneota
Second Vice President—F. J. Hirschboeck, M.D., Duluth
Third Vice President—C. W. Bray, M.D., Biwabik
Secretary—Carl B. Drake, M.D., St. Paul
Treasurer—F. L. Beckley, M.D., St. Paul

PROGRAM OF THE MINNESOTA STATE MEDICAL ASSOCIATION

Fifty-sixth Annual Session
October eighth to tenth
1924

THURSDAY MORNING—OCTOBER 9TH
8:30 A. M.

MEDICAL SECTION

E. L. TUOHY, M.D., Chairman
CHARLES N. HENSEL, M.D., Secretary
Knights of Columbus Hall

1. Differential Diagnosis of Pulmonary Disease—M. George Milan, M.D., Warren
Discussion by George Douglas Head, M.D., Minneapolis; Walter J. Marley, M.D., Minneapolis
2. Artificial Pneumothorax in Acute Lung Abscess—Everett K. Ceer, M.D., St. Paul
Discussion by W. S. Lemon, M.D., Rochester; J. N. Myers, M.D., Minneapolis
3. Liver Functional Studies in Clinical Jaundice—Carl Hartley Greene, M.D., Rochester

4. Liver Functional Studies in Experimental Jaundice—A. M. Snell, M.D., Rochester
Discussion on both papers by Henry L. Ulrich, M.D., Minneapolis; Leonard G. Rowntree, M.D., Rochester; H. W. Walters, M.D., Rochester
5. Diabetes in Children—F. W. Schlutz, M.D., Chief Department of Pediatrics, University of Minnesota, Minneapolis
Discussion by N. O. Pearce, M.D., Minneapolis; O. W. Rowe, M.D., Duluth
6. Practical Electrocardiography—Harold E. Richardson, M.D., St. Paul
7. The Electrocardiogram in the Management of Heart Disease—E. T. F. Richards, M.D., St. Paul
Discussion by R. Edwin Morris, M.D., St. Paul; F. A. Willius, M.D., Rochester; M. H. Nathanson, M.D., Minneapolis

SURGICAL SECTION

A. C. STRACHAUER, M.D., Chairman
VERNE C. HUNT, M.D., Secretary
Sherman Theatre

1. The Treatment of Severe Injuries of the Scalp—Orville N. Meland, M.D., Warren
Discussion by A. W. Adson, M.D., Rochester; W. L. Burnap, M.D., Fergus Falls; A. A. Law, M.D., Minneapolis
2. Obstructive Jaundice and Studies in Liver Function—H. Waltman Walters, M.D., Rochester
Discussion by A. L. Cameron, M.D., Minneapolis; A. C. Strachauer, M.D., Minneapolis; A. A. Zierold, M.D., Minneapolis
3. Foreign Proteins as Therapeutic Agents in the Treatment of Acute Ocular Inflammation—John F. Fulton, M.D., St. Paul
Discussion by Paul Berrisford, M.D., St. Paul; W. L. Benedict, M.D., Rochester; W. R. Murray, M.D., Minneapolis; Carl Larsen, M.D., St. Paul
4. Preoperative Treatment of the Prostatic—Gilbert J. Thomas, M.D., Minneapolis
Discussion by H. C. Bumpus, M.D., Rochester; Oscar Owre, M.D., Minneapolis; Edward Bratrud, M.D., Warren
5. Acute Osteomyelitis in Children—Carl C. Chatterton, M.D., St. Paul
Discussion by M. H. Tibbetts, M.D., Duluth; H. T. Jones, M.D., Rochester; P. W. Giessler, M.D., Minneapolis; C. A. Reed, M.D., Minneapolis
6. Perforating Gastric Ulcer—P. E. Stangl, M.D., St. Cloud
Discussion by H. C. Cooney, M.D., Princeton; H. B. Zimmerman, M.D., St. Paul; C. H. Mayo, M.D., Rochester; E. M. Jones, M.D., St. Paul
7. Consideration of Various Abdominal Symptoms and Findings in Diagnosis—William R. Bagley, M.D., Duluth
Discussion by J. P. Schneider, M.D., Minneapolis; J. A. Johnson, M.D., Minneapolis; Robert Earl, M.D., St. Paul

THURSDAY AFTERNOON—OCTOBER 9TH

2:00 P. M.

General Session
Sherman Theatre

CANCER SYMPOSIUM

1. Carcinomata as Shown by Paper Models Reconstructed From Serial Section—Margaret Warwick, M.D., St. Paul
2. Some Unusual Pathologic Features Concerning Cancer—Harold Robertson, M.D., Rochester
3. The Destructive and Constructive Surgery of Malignancy—Harry P. Ritchie, M.D., St. Paul
4. The Relative Value of Surgery and Radiotherapy—William J. Mayo, M.D., Rochester
5. What the Laity Should Know About Cancer—William A. O'Brien, M.D., Minneapolis

FRIDAY MORNING—OCTOBER 10TH

8:30 A. M.

MEDICAL SECTION

Knights of Columbus Hall

1. Amebiasis—T. B. Tuttle, M.D., Veterans' Bureau
Discussion by A. J. Chesley, M.D., State Board of Health; W. L. Pollock, M.D., Rochester; Margaret Warwick, M.D., St. Paul
2. Hemorrhagic Purpura—H. Z. Giffin, M.D., Rochester
Discussion by S. Marx White, M.D., Minneapolis; J. P. Schneider, M.D., Minneapolis
3. Some Observations Concerning Tic Douloureux After Sixteen Years' Experience—Charles R. Ball, M.D., St. Paul
Discussion by A. S. Hamilton, M.D., Minneapolis; J. C. Michael, M.D., Minneapolis
4. The Role of Infections in Nervous Disease—W. H. Hengstler, M.D., St. Paul
Discussion by Henry W. Woltmann, M.D., Rochester; A. S. Hamilton, M.D., Minneapolis
5. Diathermy in Vascular Circulatory Disturbances and Arthritis—A. E. Flagstad, M.D., St. Paul
Discussion by P. G. Boman, M.D., Duluth; G. S. Wat-
tam, Warren; G. E. Brown, M.D., Rochester
6. Cutaneous Picture of Late Syphilis—Paul A. O'Leary, M.D., Rochester
Discussion by S. Sweitzer, M.D., Minneapolis; A. H. Schwartz, M.D., Duluth
7. Diseases of the Pancreas; Discussion of the Important Symptoms and Findings with Report of Cases—Moses Barron, M.D., Minneapolis
Discussion by George Douglas Head, M.D., Minneapolis

SURGICAL SECTION

Sherman Theatre

1. The Silent Antrum—W. L. Burnap, M.D., Fergus Falls
Discussion by H. I. Lillie, M.D., Rochester; Horace Newhart, M.D., Minneapolis; J. D. Lewis, M.D., Minneapolis; J. T. Schlesselman, M.D., Mankato
2. Surgical Accidents in Simple Inguinal Hernioplasty—Emil C. Robitshek, M.D., Minneapolis
Discussion by J. C. Masson, M.D., Rochester; G. G. Eitel, M.D., Minneapolis; Gustav Schwyzer, M.D., Minneapolis; A. R. Colvin, M.D., St. Paul

3. Arthroplasties—M. S. Henderson, M.D., Rochester
Discussion by Emil Geist, M.D., Minneapolis; Wallace Cole, M.D., St. Paul; C. C. Chatterton, M.D., St. Paul
4. Fractures of the Spine—Emil F. Geist, M.D., Minneapolis
Discussion by M. S. Henderson, M.D., Rochester; C. B. Lewis, M.D., St. Cloud; A. E. Wilcox, M.D., Minneapolis; C. A. Reed, M.D., Minneapolis
5. Relative Merits of the Different Surgical Procedures for Duodenal Ulcer—D. C. Balfour, M.D., Rochester
Discussion by A. C. Strachauer, M.D., Minneapolis; H. P. Ritchie, M.D., St. Paul; A. T. Mann, M.D., Minneapolis; T. L. Chapman, M.D., Duluth
6. Tracing Infections in a Surgical Service—Arthur N. Collins, M.D., and Fred Ritz, Bacteriologist, Duluth
Discussion by Walter E. Sistrunk, M.D., Rochester; William C. Carroll, M.D., St. Paul; A. C. Baker, M.D., Fergus Falls
7. Anesthesia in Goiter Operations at the Schmieden Clinic—C. Alexander Hellwig, M.D., St. Cloud (temporarily), Frankfort-am-Main, Germany

FRIDAY AFTERNOON—OCTOBER 10TH

2 P. M.

General Session
Sherman Theatre

1. Installation of Officers
2. The Behavior of the Testes Under Varying Experimental Conditions and the Function of the Scrotum: Transplantation Cryptorchidism and Vasectomy—Carl R. Moore, M.D., Department of Zoology, University of Chicago, Chicago, Illinois
3. Child Guidance—Lawson G. Lowrey, M.D., Minneapolis
4. Routine Examination of the New-born—O. W. Rowe, M.D., Duluth
Discussion by F. C. Rodda, M.D., Minneapolis; Walter R. Ramsey, M.D., St. Paul
5. Differential Diagnosis of the Pre-eclamptic Toxemias and Nephritic Toxemias of Pregnancy—Albert G. Schulze, M.D., St. Paul
Discussion by J. C. Litzenberg, M.D., Minneapolis; W. A. Coventry, M.D., Duluth
6. Periodic Physical Examinations—Henry Wireman Cook, M.D., Minneapolis
Discussion by C. H. Mayo, M.D., Rochester; C. N. McCloud, M.D., St. Paul
7. Health Movie

LYMANHURST AND PARKVIEW STAFF MEETING

The regular monthly meeting of the Lymanhurst and Parkview medical staffs will be held at Lymanhurst School, 1800 Chicago Avenue, Minneapolis, Tuesday evening, October 28, at 7:00 o'clock.

Following is the program for the evening:

"Recent Literature on Tuberculosis in Infancy and Childhood," Dr. David M. Siperstein.

"Types of Tuberculosis at Different Ages," Dr. C. A. Stewart.

"Biological Tests in Infancy and Childhood," Dr. Cecile Moriarty.

"Bronchiectasis in Childhood," Dr. R. W. Morse and Dr. H. Lippman.

All persons interested in tuberculosis are invited to attend these meetings and participate in the discussions.

MINNESOTA ACADEMY OF MEDICINE

MEETING OF SEPT. 10, 1924

The Minnesota Academy of Medicine held its annual meeting at the Town and Country Club on Wednesday evening, September 10, at 8 P. M. The meeting was called to order by the President, Dr. A. S. Hamilton. There were 27 members present.

The minutes of the May meeting were read and approved.

The annual reports of the Secretary and Treasurer were read and accepted.

The annual election was held and the following officers were elected:

President—Harry P. Ritchie, M.D., St. Paul

Vice President—Henry L. Ulrich, M.D., Minneapolis

Secretary-Treasurer—John Eldon Hynes, M.D., Minneapolis (re-elected)

Dr. John F. Fulton, first president of the Academy, and Dr. S. Marx White, escorted the newly elected president to the Chair.

The retiring President, Dr. Hamilton, then read his President's address, entitled "Historical Survey of the Academy of Medicine."

The meeting adjourned.

JOHN E. HYNES,
Secretary.

AMERICAN ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

At the twenty-ninth annual meeting of the American Academy of Ophthalmology and Otolaryngology, held in Montreal, September 15 to 20, Dr. Horace Newhart, of Minneapolis, was elected president. The following Northwestern Fellows were present: From Minneapolis, Dr. Howard S. Clark, Dr. Wm. R. Murray, Dr. Horace Newhart, Dr. John A. Pratt, Dr. James S. Reynolds; from St. Paul, Dr. H. W. Grant; from Hibbing, Dr. W. E. Morsman; from Rochester, Dr. W. L. Benedict and Dr. Burt E. Hempstead; from Aberdeen, S. D., Dr. Robt. D. Alway, and Dr. A. E. Johnson from Watertown, S. D.

Dr. Carl C. Wold, of St. Paul, was elected a Fellow, and Dr. E. J. Brown, of Minneapolis, was made a Life Fellow. The next meeting will be held in Chicago.

OF GENERAL INTEREST

Dr. H. B. Aitkens, Le Sueur Center, spent the month of September in northern Wisconsin.

Dr. Joseph F. Borg has opened offices at 636 Lowry Bldg., St. Paul, for the practice of medicine.

Dr. Josephine Tofte has moved from Minneapolis to Fisher, where she was formerly located.

Dr. D. R. Hastings of Duluth has recently moved to Oak Terrace for the practice of his profession.

Dr. Walter G. Benjamin, formerly with the Mayo Clinic, Rochester, is now located at Pipestone, Minn.

Dr. F. G. Hedenstrom has opened offices at 218 Lowry Bldg., St. Paul, for the practice of his specialty, Pediatrics.

Dr. Karl E. Kretschmar, formerly of Minneapolis, has located in Los Angeles, Cal., for the practice of his profession.

Dr. E. Eric Larson of the Mayo Clinic, Rochester, is now associated in practice with the Woodland Clinic, Woodland, Cal.

Dr. L. A. Calkins has moved from Minneapolis to Charlottesville, Virginia, where he is associated with the University of Virginia.

Dr. Leo G. Rigler, Minneapolis, is now in the East where he is taking a course in advanced work in Roentgenology. Dr. Rigler expects to return to Minneapolis the first of next year.

Dr. Clyde E. Gray, formerly of Rush City, is now associated in practice with Dr. G. M. Edwards, Denver, Colorado. Dr. Gray disposed of his practice at Rush City to Dr. A. E. Holmes last spring, following which he took up post-graduate work in surgery in Chicago and New York. Dr. Gray had practiced in Rush City for the past eighteen years.

The thirty-seventh annual meeting of the North Dakota State Medical Association was held in Bismarck, September 10 and 11, 1924. Among the visitors from Minnesota who took part in the program were Drs. Theodore Bratrud, E. L. Tuohy, E. S. Judd, W. R. Ramsey, W. A. Jones and S. G. Sweitzer.

Reports indicate that Syracuse, N. Y., is having more than its share of infantile paralysis this summer. Six cases were reported in June and thirty-two in July. It is interesting to note that the initial cases were among Italian children, as was the case in the 1916 epidemic in New York City and the 1921 epidemic in Utica.

A recent survey made by a group of University of Minnesota students of 309 households showed that 40 to 48 per cent of the members read the health news published by newspapers and that about half of them follow the health instructions. About 25 per cent of the households studied were those of mechanics and laborers.

Exercises for the laying of the cornerstones of Todd Memorial Hospital and the Cancer Institute on the University Campus, Minneapolis, were held at 2 P. M., Wednesday, October 1, 1924. President Coffman, of the university, presided and addresses were delivered by Dr. Arthur Dean Beban, of Chicago, and Dr. Edward L. Tuohy, Duluth.

Alumni of the University Medical College, Kansas City, Mo., will hold a reunion banquet, Wednesday, October 15, 1924, at 6:30 P. M. in the banquet room of the Kansas City Athletic Club, 11th and Baltimore, Kansas City, Mo. Dur-

ing the noon hour of the same day the various classes from 1882 to 1913 inclusive will hold individual class reunion luncheons. The reunion banquet is a part of the program of the Kansas City Clinical Society, which will convene in Convention Hall, Kansas City, Mo., October 13 to 18, 1924.

In recognition of the far-reaching developments of bronchoscopy in the diagnosis and treatment of diseases of the lungs and of esophagoscopy and gastroscopy in the diagnosis and treatment of diseases of the esophagus and stomach, the Board of Trustees and Faculty of the Jefferson Medical College have created a new chair, to be known as the Department of Bronchoscopy and Esophagoscopy. Dr. Chevalier Jackson, formerly Professor of Laryngology in the Jefferson Medical College, has been elected to the professorship of the new department. Dr. Fielding O. Lewis has been elected to fill the Chair of Laryngology vacated by Dr. Jackson.

NEW AND NON-OFFICIAL REMEDIES

The following have been accepted by the Council on Pharmacy and Chemistry:

COLEMAN AND BELL COMPANY:

Gentian Violet Improved Medicinal

HYNSON, WESTCOTT AND DUNNING:

Meroxyl

Meroxyl Tablets-H. W. and D.

JENSEN-SALSBERY LABORATORIES:

Rabies Vaccine (Human) Phenol Killed

ELI LILLY AND COMPANY:

Oridine

Oridine Tablets

H. A. METZ LABORATORIES:

Silver-Salvarsan. 0.6 gm. ampules

NATIONAL ANILINE AND CHEMICAL COMPANY:

Gentian Violet Medicinal—"National"

PARKE, DAVIS AND COMPANY:

Diphtheria Toxin-Antitoxin Mixture, 0.1 L+-P. D. and Co.

E. R. SQUIBB AND SONS:

Antistreptococcic Serum-Squibb, packages one 10 cc. syringe

Antistreptococcic Serum-Squibb, packages one 50 cc. vial

Antistreptococcic Serum Rheumatic-Squibb, packages one 20 cc. vial

Antistreptococcic Serum Rheumatic-Squibb, packages one 50 cc. vial

Diphtheria Toxin Antitoxin Mixture (New Formula), packages thirty 1 cc. ampules

Sulpharsphenamine-Squibb, 1 gm. ampules

Sulpharsphenamine-Squibb, 3 gm. ampules

FREDERICK STEARNS AND COMPANY:

Insulin-Stearns Quadruple Strength

WILSON LABORATORIES:

Ampules Pituitary Solution-Wilson, 0.5 cc.

NONPROPRIETARY ARTICLES:

Thiosinamine

Gentian Violet Medicinal

NEW AND NON-OFFICIAL REMEDIES

Holocaine Ointment-M. E. S. Co.—Composed of holocaine (see New and Non-official Remedies, 1924, p. 35) 1 per cent, water 1 per cent, wool fat and petrolatum 98 per cent. Put up in collapsible tubes for application to the eye. Manhattan Eye Salve Co., Louisville, Ky. (Jour. A. M. A., Aug. 2, 1924, p. 357.)

Silver-Salvarsan, 0.6 Gm. Ampules.—Each ampule contains silver-salvarsan (see New and Non-official Remedies, 1924, p. 54) 0.6 gm. H. A. Metz Laboratories, New York.

Diphtheria Toxin-Antitoxin Mixture 0.1 L+.—A diphtheria toxin-antitoxin mixture (see New and Non-official Remedies, 1924, p. 299), each cc. representing 0.1 L+ dose, of diphtheria toxin, neutralized with the required amount of antitoxin. It is marketed in packages of three bulbs, each containing 1 cc.; also in vials containing 20 cc. Parke, Davis and Co., Detroit. (Jour. A. M. A., Aug. 16, 1924, p. 508.)

PROPAGANDA FOR REFORM

Camphor in Oil in Heart Failure.—Marvin and Soifer have studied the effects of camphor in oil as a cardiac stimulant. They failed to secure evidence of any action on heart rate, respiration, blood pressure, vital capacity or the general clinical condition in which digitalis is frequently promptly effective. Henceforth, the burden of proof that camphor in oil has a rational place in the treatment of congestive heart failure rests with its advocates. All others may well hesitate to place their trust in a drug that seems to have given more promises than therapeutic performances. (Jour. A. M. A., August 2, 1924, p. 362.)

More Misbranded Nostrums.—The following products have been the subject of prosecution by the federal authorities charged with the enforcement of the Food and Drugs Act: DeWitt's Kidney and Bladder Pills (E. C. DeWitt and Co.), consisting essentially of methylene blue, potassium nitrate and plant material, including a volatile oil such as juniper oil. Foster's Backache Kidney Pills (Porto Rico Drug Co.), consisting of potassium nitrate, rosin, fenugreek, uva ursi and an essential oil such as juniper. Glycofostina (Henry S. Wampole Co., Baltimore), consisting essentially of strychnin sulphate, sodium calcium and potassium glycerophosphate, alcohol and water. (Jour. A. M. A., Aug. 2, 1924, p. 375.)

Rectal Administration of Digitalis.—Digitalis is absorbed rapidly and fairly uniformly from the alimentary tract of man, although some substances in the digitalis group, notably strophanthus products, are unsuited for oral administration. However, nausea, vomiting or surgical operations may sometimes interfere with the use of digitalis by mouth. For such emergencies digitalis may be satisfactorily administered by rectum. In many patients with auricular fibrillation, the results have been rapid and beneficial. Rectal digitalis therapy is not intended to supplant the well-established oral method of administration, but rather to be used as an emergency measure when the customary mode of introduction is not feasible. (Jour. A. M. A., Aug. 9, 1924, p. 446.)

Anaphylactoid Phenomena and Modern Therapy.—Anaphylaxis is that state of hypersusceptibility to a given substance which has been induced by a previous injection of the same substance. The reaction is limited to substances of a protein nature. A considerable variety of chemically

unrelated substances may produce "anaphylactoid" symptoms after intravenous injection by virtue of their causing occlusion of the pulmonary capillaries by thrombosis or by agglutinated corpuscles or platelets. Some of the substances which may produce anaphylactoid phenomena have been widely proposed for intravenous therapy, including a variety of "colloidal" solutions of iron, mercury, arsenic, antimony and protein, as well as extracts of animal tissues. In consideration of the possibility of anaphylactoid reactions being induced by such substances, it is well to reiterate that there seems to be little, if any, justification for the intravenous administration of such agents as hexamethylenamin, sodium iodid, and sodium salicylate, because their systemic effects are readily obtained by oral administration. (Jour. A. M. A., Aug. 23, 1924, p. 614.)

Scarlet Fever Toxin.—Scarlet fever toxin has been furnished by the John McCormick Institute to some city and state health departments. Physicians inquiring for this material should apply to their local health department. There is an increasing demand for standardized toxin that the Drs. Dick believe should be met; however, because the toxin must be standardized on human beings, the commercial companies are going to find it difficult to standardize accurately. (Jour. A. M. A., Aug. 30, 1924, p. 705.)

Chlorin Inhalations in Respiratory Affections.—Numerous devices have been advanced for the inhalation of chlorin gas. Several municipal health departments have installed treatment chambers where such devices are undergoing extensive experimentation. It is impossible to say if the virtues of the method have been demonstrated, and it must be considered in an experimental stage. The indications are that chlorin inhalations will not produce bacterial sterilization of the mucous membrane, although they seem to reduce the number of bacteria found on the tissues. The duration of an adequate treatment, the concentration of gas to be used, the methods by which the gas is to be produced, and similar factors are still the subject of experimentation. (Jour. A. M. A., Aug. 30, 1924, p. 691.)

Fatal Anaphylaxis From Hemostatic Preparations.—Recently a death was reported which was caused by the injection of a hemostatic preparation. It was discovered afterwards that the patient was a sufferer from asthma and that the attacks were elicited even by the mere approach of a horse. Because of the importance of determining the anaphylactic possibilities of the various blood coagulants, the Council on Pharmacy and Chemistry had specimens of the following preparations examined: Coagulen-Ciha, Fibrogen-Merrell, Hemagulen-Lilly, Kephalin-Armour, Hemostatic Serum Lapenta (Hemoplastin)? P. D. and Co., Thromboplastin-Lederle, Thromboplastin-Squibb, Thromboplastin Hypodermic-Squibb, Thromboplastin Solution-Armour, Precipitated Horse Serum (Coagulose)-P. D. and Co. It was found that all of the specimens contained animal protein (in most cases horse or beef protein was present). In most cases the labels and descriptive literature did not state the precise nature of the coagulant. Since blood coagulants are usually administered as an emergency measure, physicians may overlook the danger and introduce these foreign proteins into a hypersensitive person. The Council recommends that all hemoplastic preparations be labeled to show the composition of the product, the character of the

protein present, and to contain information which will cause the physician to inquire into the patient's history to learn if hypersensitivity exists. (Jour. A. M. A., Aug. 30, 1924, p. 705.)

CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

**PREGNANCY WITH COMPLICATIONS: CHRONIC APPENDICITIS; LOW ANTERIOR IMPLANTATION OF PLACENTA; DOUBLE FOOTLING BREECH PRESENTATION; FORCEPS ON THE AFTER-COMING HEAD; HIGH POSTERIOR SECOND DEGREE LACERATION WITH SECOND DEGREE LEFT LAT-
ERAL EPISIOTOMY.**

DANIEL H. BESSESEN, M.D.,
Minneapolis

The patient, aged 25, was first seen on October 29, 1923, complaining of scanty menses occurring at irregular periods and constipation with pains in the lower right quadrant. The family and social histories were without importance in this case. She had never been pregnant. On Dec. 11, 1923, the nausea and vomiting were worse, and pains of knife-like character were felt in the lower right quadrant, with distinct tenderness over McBurney's point. On pelvic examination the uterus was found enlarged and the diagnosis of pregnancy with chronic appendicitis was made. Operation was advised, and on December 13, 1923, an adherent appendix was removed. Convalescence was without special note and marked improvement in the patient's general condition was the result. Nothing further occurred of importance until at delivery, on June 1, 1924, when the patient suffered from slightly prolonged first and second stages of labor. Twins were suspected in this case because of the presence in the pelvis of a mass first taken to be a head, but later found to be the placenta. After dilatation was complete, the progress still being slow, the patient was put under complete anesthesia and an effort made to push the mass into the abdomen. The feet of the fetus were grasped, brought down and breech delivery done with the exception of the head. Here such difficulty was encountered in extracting the child, that forceps were applied, a left lateral incision in the perineum made and the head delivered. The release was so sudden that a high posterior second degree laceration of the perineum occurred in addition to the episiotomy. The repair healed per primam.

Appendicitis in pregnancy is of fairly frequent occurrence. It has been observed in general that operations on pregnant women, if done carefully and gently, are not inducive to abortion. It is well to advise according to the individual case.

A low anterior implantation of the placenta is not a common occurrence and when it does occur, it is sometimes of serious import. It frequently leads to early dislodging of the fetal circulation with resulting asphyxiation of the child. When necessary to completely separate the placenta, much speed is required, and often Dührsen incisions into the uterus are of value in securing rapid dilatation.

In applying forceps on the after-coming head, either the assistant may hold the child, or the body of the fetus may be laid on the abdomen of the mother. This facilitates the application.

In the case just cited, the forced required to extract the head, led to the posterior laceration additional to the episiotomy. It occupied all of six minutes from the time of the delivery of the umbilicus to the time of the delivery of the head, so that a white baby was born, resuscitated by hot and cold water baths and by abdominal compression for artificial respiration. Both mother and child recovered nicely.

PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH
THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

ON THE MECHANISM OF RESPIRATORY TRACT INFECTION: Arthur L. Blomfield, M.D. (Tubercle [London] 1924, v, 438). In this article, Professor Blomfield, of Johns Hopkins University, sums up a series of studies on the behavior of bacteria in the upper air passages. Tradition has imposed on us the idea that the mouth is a specially favorable situation for bacterial growth, but certain objections can immediately be brought against this idea.

In the first place, the flora on the whole is remarkably constant from day to day and week to week, despite the miscellaneous horde of germs which are constantly introduced with food, fingers, and foreign objects.

Secondly, certain bacteria, such as *Bacillus Coli*, which are especially hardy and not at all capricious in their test tube requirements, are practically never found in the mouth and the chromogens of the air are almost unknown in the respiratory tract.

The series of experiments reported by Dr. Blomfield were undertaken in an attempt to throw light on this problem. Solid masses of bacterial growth from Agar slants were implanted on the tongue, the pharynx, the nasal septum, and the tonsil crypts of volunteers. The subjects were healthy people with clinically normal upper air passages.

The species studied were: *B-Coli*, *Staphylococcus albus*, *B-Influenza*, *B-Friedlander*, and *Streptococcus hemolyticus*. The one hour cultures uniformly yielded great numbers of bacteria, after two hours relatively few were obtained, and within twenty-four hours practically all had disappeared. (In the case of the tonsil crypts, a few organisms occasionally persisted for several days.)

A variety of possibilities suggested themselves by way of explanation of this phenomenon, but it seemed most likely that the flushing of the mouth secretions together with the contractions of the muscular masses of the tongue and pharynx were most important.

There exists in the mouth a highly organized mechanism by which foreign particles and bacteria are eliminated. A similar rapid elimination of bacteria from the nasal passages occurs, but here the sweep of the cilia must be the main factor in the mechanism. In addition to the mechanism described, there are other antagonistic factors. The saliva is probably an unfavorable medium for growth of most pathogenic bacteria. The bacteria normally present may exercise some opposition to the colonization of foreign bacteria. Certain groups of mucus-organism normally thrive in the mucous membranes of the upper air passages, especially hemolytic streptococcus. The dosage of bacteria and their degree of vegetative activity affect the results of implantation. Infection with meningococcus increased to nearly eighty per cent when the spacing between beds in the British Army was in one instance reduced from three to one and a half feet.

Perhaps the most important group of causes which promote bacterial invasion through the upper air passages are injuries of various kinds. Peripheral chilling (cold) is one of these, chemical injury is another, and anesthesia another; but infectious diseases, especially the so-called exanthemata, par excellence let down the bars for infection of the respiratory tract. Measles and influenza are outstanding examples, both producing local erythema.

With these considerations in mind, it may be questioned whether every tubercle bacillus which enters the nose or mouth regardless of source actually invades or even threatens invasion.

ARTHUR T. LAIRD.

PEDIATRICS

SUPERVISORS:

CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS
ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

ERFAHRUNGEN MIT DUBO: Dr. van Mallinckrodt (Monatschr. f. Kinderh., Bd. 27, Jan., 1923, pp. 438-441). The author thinks that Dubo is especially suited as a complementary feeding in weak infants that refuse large amounts of food. He finds its high calorie value of great importance in bottle-fed babies with impaired digestive function. However, he finds that Dubo is contraindicated when any parenteral infection accompanied by vomiting sets in—due to the danger of exsiccation. Dubo is easily and simply prepared and can be used in the home.

DAVID SIPERSTEIN.

DEHYDRATION: Owen H. Wilson, M.D. (Arch. of Ped., Feb., 1924). In young children the chief source of

water is in milk, which is nearly 90 per cent water, a normal year-old requiring at least 40 ounces of milk daily. In many acute illnesses, food (milk) is discontinued, or, as in the case at hand, is refused, and consequently dehydration is imminent. This is especially true of infectious diarrhea with its excessive fluid drain. This excessive drainage depletes the body fluids, causing the parched mouth, the drawn expression, the sunken eyes, and the dry, parchment-like skin and feeble, thready pulse. Most of the serious complications of infectious diarrhea are traceable to dehydration. When milk is refused or discontinued, the water supply is practically stopped. A sick baby requires as much or more water than a well one. If possible, it may be best to give specified quantities at stated intervals, though this rarely succeeds, and little harm is done by giving fluid at any time the patient will take it. If vomiting continuously, we must resort to intravenous, intraperitoneal, or subcutaneous methods. Giving fluid by the bowel is rarely successful in babies and must not be relied upon. The following method has been used by me for several years. The patient, in a recumbent position, is wrapped in a sheet, the head being steadied by an assistant. A teaspoon is introduced into the mouth, leaving about one-fourth of the bowl protruding beyond the teeth. The curved bowl prevents the teeth or gums from closing, and is far enough into the mouth to prevent the tongue from being pushed up against the roof of the mouth, and obstructing the fluid. Now pour the liquid into the projecting fourth of the bowl with another spoon, or better with a hottle. The fluid fills the pharynx and must be swallowed before breathing is possible. This method would not be advised in a comatose baby, in infants under one month of age, in whooping-cough, or when there is laryngeal paralysis. It is a most excellent way to give castor oil to a refractory patient. Remember in treating a sick baby he must have his daily quart.

R. N. ANDREWS.

COLIC IN BREAST-FED INFANTS AS A RESULT OF SENSITIZATION TO FOODS IN THE MOTHER'S DIETARY: W. Ray Shannon (*Arch. of Ped.*, December, 1921). For some time it has been held that the diet of the mother could not affect a breast-fed infant. Shannon, in a previous paper, has shown, however, that food taken by the mother may appear in the breast milk and give rise to ana-phylactic reactions in the infants. These reactions may affect the skin, respiratory or the gastro-intestinal system.

He cites six cases of colic in infants due to such reactions. In each case skin tests were done on the infant with foods from the mother's dietary and positive results obtained. The removal of the offending foods caused the disappearance of the colic. In each of these cases egg was one of the foods which caused the trouble; it is noted that egg protein has been responsible for some of the manifestations of exudative diathesis in artificially-fed children.

It is concluded that the food allergy demonstrated in these cases is a reasonable basis for explanation of the old statement, "that all breast milk is not the best food for every baby."

A. M. SNELL.

ENZEPHALOGRAPHIE IM SAUGLINGSALTER: Knoepfelmacher (*Jahrbuch f. Kinderheilkunde*, March 5, 1924, pp. 181-187). Knoepfelmacher recommends encephalography as a valuable diagnostic procedure in infancy. He removes small amounts of cerebrospinal fluid through a ventricular puncture and injects an equal amount of air into the ventricle. He thinks that this technique enables one to make a definite diagnosis of hydrocephalus. He also considers it an aid in the diagnosis and localization of brain abscesses.

DAVID SIPERSTEIN.

MENINGOCOCCUS MENINGITIS: (*Archivos Españoles de Pediatría*, Madrid, Nov., 1923). (*Arch. of Ped.*, May, 1924). The vascular communication with the ear in very young children explains the frequency of meningitis in connection with otitis. The otitis is often metastasis of meningococcemia. With headache, vomiting and fever, followed by signs indicating muscular hypertonicity (Kernig, etc.) lumbar puncture is imperative, and serotherapy should be continued with large doses until the meningococci have definitely disappeared. The spinal fluid may show 3 gm. of albumin and 54 cells per cubic millimeter, as in one convalescent recently, but this alone does not call for continuation of the antiserum. Parallel lumbar puncture and injection of saline in some healthy children showed up to 2 gm. albumin and 40 or 50 cells. One child died the eighty-fourth day, and meningococci were found in the fluid. Serotherapy had been discontinued a month before. González Alvarez reiterates the warning that the throat of all contacts must be disinfected, and serotherapy must be pushed with larger doses than those generally used.

R. N. ANDREWS.

ACIDOSIS AND TOXIC SYMPTOMS OF SEVERE DIARRHEA OF INFANCY (*The Lancet*, London, Oct. 29, 1921; *Arch. of Ped.*, February, 1924). In certain of the diarrheas of infancy, symptoms of intoxication, the chief of which is increased pulmonary ventilation, are accompanied by a reduction in the reserve of bicarbonate in the blood plasma. The hypernea and the alkali reserve vary inversely. The reserve can be increased to normal by the administration of sodium bicarbonate. Hypernea is thus controlled and the general toxic symptoms are alleviated, but the ultimate outcome, in the diarrheal cases at any rate, is little influenced. Necropsy throws no light on the questions of the site or extent of the damage done. The usual lesions of gastroenteritis are the only ones found. Depletion of the alkali reserve is not a cause of the diseased condition, but is caused by it and is essentially, like an elevation of temperature or an acceleration of the heart rate, a variation in a physiological constant, an indication of deranged function. And just as fever and tachycardia demand certain therapeutic measures for their own sake, so acidosis indicates the administration of alkali and fluid and the stimulation of excretion. When the acid produced and the cause of its production are known more specific therapy may be available. These observations have confirmed the work of previous investigators.

R. N. ANDREWS.

ROENTGENOLOGY

SUPERVISORS:

LEO G. RICLER,

MPLS. GEN'L HOSPITAL, MINNEAPOLIS

A. U. DESJARDINS,

MAYO CLINIC, ROCHESTER

Of the eight cases reported there were four carcinomata, one epithelioma, one endothelioma, one chondrosarcoma and one xanthoma.
LEO G. RICLER.

RONTGENBESTRAHLUNG NACH RADIKALOPERATION DES BRUSTDRUSENKREBSSES: W. F. Wassink and C. Ph. Wassink von Raamsdonk (*Acta Radiologica*, v. 3, p. 113, June, 1924). Three groups of cases of mammary carcinoma, in which roentgenotherapy was employed were considered.

The first, consisting of 78 cases, were operated in their clinic and given heavy doses of radiation within two weeks of the operation.

The second, consisting of 30 cases, were operated elsewhere and were given radiation some time after operation.

The third, consisting of 92 cases, were operated elsewhere, without radiation after operation, and came to them for radiation after recurrence.

In the first two groups very few recurrences were noted while in the third they were frequent. Radiation had very little effect in the recurrent cases. The results in the cases radiated at once after operation indicate that postoperative roentgenotherapy is of considerable value. They could find no case, in which there was no carcinomatous infiltration of the skin, which was harmed by the radiation.

LEO G. RICLER.

OSSEOUS DEVELOPMENT IN ENDOCRINE DISORDERS: Engelbach and McMahon (*Radiology*, v. 2, p. 378, June, 1924). This paper, published simultaneously in "Endocrinology," is an attempt to present the changes in time of appearance and time of union of the nuclei and epiphyses of the bones. Numerous charts are presented, giving, in tabulation form, the usual accepted normal standards, the authors' normal standards, and their method of examination. Their normal standards differ from those of the anatomists, the pediatricians, and the roentgenologists. They believe this is due to a stricter ruling out of slight endocrine disturbances from their group of normals.

The material presented is too extensive to be properly summarized. They believe roentgen examination of the bones may prove to be more valuable in the diagnosis of endocrine disorders than any other form of examination. Their findings in all the bones in hypothyroidism, hypogonadism and eunuchoidism, anterior lobe pituitary insufficiency, pluriglandular syndrome, pubertas, præcox, and thymolymphatism are given with profuse illustrations.

LEO G. RICLER.

THE DIAGNOSIS OF PRIMARY INTRATHORACIC NEOPLASMS: (Am. Jour. Roent., May, 1924). Eight cases of primary intrathoracic neoplasms in which the diagnosis was correctly made during life are reported. In four of these the roentgen examination was the chief diagnostic measure and the authors believe it is the most important means of diagnosis. They advocate more routine roentgen examinations rather, than as now used, for confirmatory purposes. They emphasize the early use of stereoscopic plates before pleural effusion or lung collapse has appeared as the findings may be obscured by the latter.

A brief discussion of the pathology, symptoms and physical signs is given.

Roentgenologically the cases must be distinguished first from inflammatory processes, second from benign tumors. Tuberculous lobar pneumonia must be distinguished from the massive lobar type of carcinoma and miliary tuberculosis from miliary carcinosis.

Malignant tumors differ from benign in that they are rapidly growing, have an indistinct border, radiate, are multiple, show metastases to ribs and vertebrae and have pleural effusions frequently. Another secondary manifestation of importance is the collapse or complete filling of a lobe due to obstruction of a bronchus by tumor mass.

They advise paracentesis in cases with pleural effusion followed immediately by roentgen examination as the fluid returns very rapidly in malignant cases. They have derived no diagnostic benefit from pneumothorax. Hodgkin's and lymphosarcomata may be distinguished by their rapid response to mild doses of x-rays.

RENAL FLUOROSCOPY AT THE OPERATING TABLE: Braasch and Carman (*Radiology*, April, 1924). In all cases of operation for kidney stone, where nephrectomy is not contemplated, fluoroscopy of the delivered kidney at the operating table is of value for three reasons: (1) Stones previously unrecognized can be detected; (2) stones can be accurately localized; (3) the removal of all stones can be assured. In many cases pre-operative roentgenograms do not demonstrate all the stones or indicate two stones where one branched one is present. Frequently, it is difficult to locate the stones without needling and incising the cortex, which is very injurious to the kidney. It is often impossible to determine whether all stones or pieces of stones have been removed, if palpation alone is used. Without using this method about 10 per cent of post-operative roentgenograms showed stones which had not been removed. With this method the percentage was reduced to 1.2 per cent.

The important facts in technique are thorough dilatation of the eyes, thorough darkening of the room, and as complete delivery of the kidney through the wound as possible. A short pedicle or fixed kidney may interfere materially with the success of the procedure. The roentgenologist guides the surgeon's forceps to the stone. The authors prefer fluoroscopy to roentgenograms of the delivered kidney, although the latter are of advantage when the kidney cannot be raised above the abdominal wall. They conclude that conservative operation for kidney stone cannot be done with complete success without the aid of fluoroscopy at the operating table.

LEO G. RICLER.

BOOK REVIEWS

GOITER: NON-SURGICAL TYPES AND TREATMENT.

Israel Bram, M.D., Instructor in Clinical Medicine, Jefferson Medical College. 479 pages. Illustrated. New York: The MacMillan Co., 1924.

This monograph on goiter gives a very complete review of the anatomy and physiology of the thyroid gland, with a classification of goiter arranged according to: (1) pathology, (2) clinical signs, (3) therapeutics. The classification under Therapeutics is as follows:

A. Surgical Goiter. Adenomatous, cystic and all other thyroid enlargements not classified under non-surgical goiter.

B. Non-surgical Goiter.

1. Parenchymatous hypertrophy.
2. Colloid goiter.
3. Puberty hyperplasia.
4. Hyperplasia of exophthalmic goiter (Graves disease).

About 100 pages are devoted to the diagnosis, prevention and treatment of simple goiter and puberty hyperplasia and contain nothing that has not been standard for a long time.

The balance of the book, some 350 pages, is devoted to the etiology, symptomatology, diagnosis (with a very good review of the various diagnostic tests), prognosis and the author's views as to the treatment and management of all cases of exophthalmic goiter. A considerable number of case histories are presented in support of the author's conclusion that "Surgery, unable to remove the cause of the affection, is a fallacious procedure. Non-surgical measures, the rational therapeutics of exophthalmic goiter, overcoming the dysfunction of the various structures and organs of the body and restoring the interglandular and neuroendocrine relationship, break up the various physical and mental vicious circles with consequent restoration to permanent health.

"All things being equal, the prognosis of Graves' disease under non-operative treatment is excellent; recovery is complete and permanent, and the patient, taught how to 'carry on' and imbued with a healthy philosophy of life, becomes and remains stronger in body and mind than ever before."

The book is profusely illustrated with photographs and charts and has a voluminous bibliography.

HARRY OERTING, M.D.

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ORIGINAL ARTICLES

NOTES BY THE WAY—WISE AND OTHERWISE*

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From Hippocrates of Cos to his English successor, Sydenham, is a long cry—a little over 2,000 years; and since the birth of the latter—three hundred years—more advance has been made in medicine than in all the preceding years of human history. So great was the admiration of Boerhaave, the great physician of Leyden, that he never mentioned Sydenham's name without lifting his hat. A writer¹ of an historical retrospect of surgery in 1824 very confidently asserted "that surgery, operative surgery, has now clearly achieved all that can be expected from it." Yet, within the ken of my professional experience, medical science has made its most notable achievements, greater than in all previous times. Hippocrates relied upon the *vis medicatrix natura*; he used but few drugs, and these sparingly. It was a maxim of his "that natural powers are the healers of disease." Galen taught that disease is something to be expelled from the body, a *materia peccans*, that must be eliminated by purgation, blood letting, diaphoresis, etc. "Galen² coerced nature; Hippocrates supported her." A happy medium between these two really complementary conceptions is the modern concept of the therapeutics of today. The successes and the failures of our historic past but stimulate to worthy endeavor, and warn against speculative theories and imaginary cures. "Study out the secrets of nature by way of experiment," says Harvey.³ This is the only safe guide. An instance of false theorizing and fanciful speculative reasoning, leading to absurd therapy with highly imaginative reports of improvement and cure,

illustrating the credulity of our profession at times, is seen in the suspension treatment for nervous diseases so popular forty years ago. In a paper⁴ at that time, based on many suspensions of tabetics made for me by the late Dr. Gillette, I said that suspension was purely empirical, without a rationale, and rested on nothing more substantial than theory. In none of our cases was there definite improvement. This procedure was used in a variety of organic nervous conditions such as amyotrophic lateral sclerosis, disseminated sclerosis, transverse myelitis, paralysis agitans, etc. Suspension was first suggested by Motchoutkowski and popularized by Charcot. The most encouraging reports came from the French and American experimenters. The English and Germans lagged, both in enthusiasm and results. In fact, Mendel and Eulenburg called attention to the fact that their patients improved more under electro-therapy than under suspension, and stated that they were glad to return to its use. The later discovery of the spirocheta pallida revealed the utter absurdity of this nerve-stretching epidemic and showed that nothing more unscientific, chimerical or ridiculous ever swept over the medical profession.

Thirty-one years ago⁵ I called attention to the value of voltaic alternatives in certain forms of atrophy of the optic nerve. Dr. Webster Fox, of Philadelphia, who had also used this form of treatment, said to me that he hesitated to publish his findings; they were so surprising that he felt that the profession would receive them incredulously. I recall one case in which the atrophy was arrested, and a clinical recovery ensued. This patient was under the constant observation of the oculist, Dr. B. F. Graham of Minneapolis, who referred him to me. Unlike suspension, this form of therapy rests on a physiological basis. The reversal of polarity in the constant current has a much more marked nutritional influence than simple closure of the circuit, while rapid reversals greatly intensify its stimulating effects. In order that this might occur with evenness and great frequency, I had an auto-

*Read before the St. Louis County Medical Society, Duluth, June 19th, 1924.

matic commutator designed that admirably accomplished this purpose. Notwithstanding the greater knowledge that has come to us with the passing years, voltaic alternatives, I believe, would prove a useful adjuvant in the treatment of the toxic forms of optic atrophy. Therapy has its fashions. The more dramatic their form, the greater the popular appeal. Static electricity as a mode of treatment is now obsolete. Even the galvanic and faradic currents, aside from diagnostic purposes, have fallen into the discard, much, I believe, to the disadvantage of the patient. Now the d'Arsonval, or high frequency current, occupies the limelight in electro-therapeutics. The most approved form of its application is that known as diathermy. It is said to warm the body tissues. The resistance of these tissues, like that of a wire, generates heat; the greater the resistance, as in passing through a bone, the greater the heat. The value of hot applications is well known, but their effect is confined to the surface, while in diathermy it is claimed that the portion of the body included between the electrodes can be raised to any desired degree of heat, and as heat is fatal to many pathogenic bacteria, it is predicted that this treatment may have a curative influence on diseased parts deeply situated. When the alternations exceed fifteen thousand a second, there is no pain; only an agreeable sensation of warmth. A moderate amperage raises momentarily the body temperature, slightly accelerates the pulse, dilates the blood vessels, and lowers the blood pressure. Its range of therapeutic usefulness includes such conditions as high blood pressure, the functional nervous disorders, pneumonia, rheumatoid arthritis, neuritis, arthritis, angina pectoris, as well as other forms of cardiac disease, neuralgias, and the persistent and intractable pain which occasionally follows herpes zoster. The therapeutic potentialities of diathermia are at present a matter of conjecture; its curative powers are yet to be determined.

The first six years of my professional life in St. Paul were spent in general practice. It was during this period that the city suffered from an epidemic of malignant diphtheria, and occurring before the days of the bacteriological laboratory, there was no possible way of distinguishing between it and tonsillitis, which at the time was widely prevalent. Dr. J. H. Murphy, a well-known St. Paul physician, big of body and humorous of speech, in commenting on the difficulties of diag-

nosis, remarked that the way he made a diagnosis was to wait and see whether the patient died or recovered; if death occurred, it was diphtheria; if he recovered, it was tonsillitis. Dr. E. J. Abbott at this time deservedly distinguished himself by his great skill and celerity in intubation in laryngeal diphtheria. Practicing medicine today, one cannot fully realize how handicapped we were without the knowledge of antitoxin or the Schick test and von Behring's toxin-antitoxin. Before antitoxin the mortality ranged from 45 to 50 per cent annually; after its use it fell to 10 per cent. From 80 to 85 per cent of the deaths occurred⁶ among children under six years of age. The recent illness of some forty school children at Concord and Bridgewater, Massachusetts, following the employment of the latter (toxin-antitoxin) is worthy of mention. The serum had been subject to prolonged cold, and investigation revealed that freezing serum caused a partial dissociation of the antitoxin from the toxin, giving rise to a toxicity which originally was absent; moderate freezing was apparently harmless; after severe freezing of eighteen hours it should never be used (Kelley). Antitoxin itself, under similar conditions, may also lose its potency. Am I too optimistic when I predict that with the universal employment of the Schick reaction and immunization by von Behring's vaccine (in only 5 per cent of the cases is it unsuccessful and has to be repeated) the conquest of this scourge will be an accomplished fact?

It is an interesting coincidence that an immunity test analogous to that of the Schick reaction in diphtheria has been found for scarlet fever. The G. F. and the G. H. Dick reaction⁷ is due to an intracutaneous injection of a soluble toxic substance obtained from the culture of certain hemolytic streptococci from scarlet fever patients, which causes a local flushing of the skin. The reaction occurs in patients who have not had scarlet fever and in the early stage of the disease. Branch and Edwards,⁸ after using the specific streptococcus filtrate of the Dicks, state that the Dick reaction has seemingly "a specific relationship to immunity to scarlet fever." Dochez⁹ reports an antiscarlatinal serum which not only blanches the skin locally in scarlet fever, but materially relieves the symptoms when used therapeutically. The observations of Blake, Trask and Lynch¹⁰ in a preliminary report confirm the findings of Dochez with regard to his scarlatinal antistreptococcus serum, both as to the

rash extinction test and its therapeutic value. Zinger has used successfully, both as a prophylactic and a therapeutic agent, the serum of convalescent and recovered scarlet fever patients. The laboratory we hope, in the near future, will find not only a curative serum, but a protective vaccination as well. A similar immunity reaction in measles, which has a death rate in children third among the acute contagious diseases, is greatly to be desired. Especially is this disease to be dreaded under the fifth year of age. The death rate in New York City in 1922 for children under one to five years of age was 93.4 per cent. Later in childhood the mortality is markedly reduced. In adults it at times assumes a serious virulence. Fortunately, convalescent serum, which fails to protect in less than three per cent of the cases, gives a limited immunity, which, according to Drs. Weaver and Crooks,¹¹ is about two months. Lasting immunization has yet to be achieved. Notable changes have occurred since those days of general practice. Phlebotomy was then a routine procedure. It was an approved treatment of lues to use an escharotic on the initial lesion and to defer other medication until after the appearance of the secondary symptoms. In my boyhood home in northwestern Ohio, where malaria was prevalent, an ounce bottle of quinine was kept on the table by many, and was partaken of with the same regularity as the meals. Now, malaria, typhoid fever, and yellow fever are practically eliminated, and soon will possess merely an academic interest. That once terrible scourge, epidemic cerebro-spinal meningitis, is a Prometheus bound.

These are only a few instances of what medicine and sanitary science have accomplished. Equally interesting to me is the disappearance of that anemia peculiar to adolescent girls, known as chlorosis, an affection in my observation of not infrequent occurrence, and by no means confined to factory girls and domestics, as certain writers would have us believe, but oftentimes seen or observed where food, fresh air and environmental conditions were far from unfavorable.* Its etiology

is obscure, but Campbell believes that "the frequency of the low specific gravity of the blood in apparently healthy women at the age of puberty suggests strongly that chlorosis is an exaggeration of a physiological change occurring in all girls rather than a disease *sui generis*. There are many other changes, structural and functional, which take place at this time, and it is known that they depend on the internal secretion of the ovary. It is difficult to avoid the conclusion that the changes in the blood also depend on changes in the ovary and that it should be considered with diseases of the ductless glands." Fifteen years ago Dr. Richard Cabot wrote, "The disease seems to be dying out." The study¹² of the Guy Hospital cases for the past thirty years is an interesting and illuminating contribution. From this it would appear that chlorosis has steadily declined since 1903. It has been many years since I have seen a case. This caused much conjecture on my part. It did not seem to me that our increased knowledge of disease or our refinements in diagnosis were sufficient to account for this. The passing of chlorosis within about a generation, without any apparent cause, medical or otherwise, is as puzzling as it is notable. This is, however, an outstanding fact, and clearly evident, and shortly this disease will possess only an antiquarian interest.

I wonder how many of you have observed the soporific action of calomel or blue mass in so-called biliousness, which is really an auto-toxemia. Mercury has been greatly abused by careless and indiscriminate administration. The inevitable reaction against it is both unjust and unreasonable and is greatly to be deprecated. For the relief of the insomnia, restlessness, headache, chilling, fever, rapid pulse, vomiting, furred tongue, serous diarrhea, mental sluggishness, etc., incident to these autotoxic attacks, calomel or blue mass affords prompt relief, and gives the patient a night of refreshing sleep. Murchison believes that mercury possesses a double action, that whether or not there is an increased secretion of bile there is more bile passed when mercury is given and an eliminating action is set up, and less of the bile constituents are absorbed from the intestine. I have noticed for years this marked soporific effect. Recently Dr. Tyson¹³ has also called attention to this unrecognized action of mercury.

It is worthy of note that 7 per cent of all medical cases are neurological and that three-fourths of all

*Professor Deneke in The Deutsche Medizinische Wochenschrift (p. 902, July 4, 1924) reports a marked decrease in chlorosis. In 1901 out of 12,000 admissions to the St. George Hospital, Hamburg, there were 201 cases of chlorosis, while in 1923 in 20,000 admissions there were only 3 cases of this disease. It was of frequent occurrence in this hospital up to 1904; the peak having been reached in 1901, with an incidence of 16.2 per thousand. After 1904 there was a rapid decline until the minimum of 0.15 per thousand was observed, in 1923. A striking decline in chlorosis has also been reported in France.

the neurological cases sustain a relation to the major problems in internal medicine (Hyslop). Our present conception of neuropsychiatry is at wide variance with that of even a decade ago. The so-called degenerative diseases of the central nervous system, such as disseminated sclerosis, progressive muscular atrophy, paralysis agitans, etc., are not due to abiotrophy, as was at one time believed, but are the clinical manifestations arising from a chronic infection, probably of a microbic nature. The acute great infections of the central nervous system are epidemic cerebro-spinal meningitis, poliomyelitis, and encephalitis lethargica. The etiology of the two former is known; that of the latter is yet to be discovered. The term functional nervous disease is a misnomer; it is inaccurate and unscientific—a medical myth. All disease manifests a perversion of function. The clinical syndromes of which they are the expression arise from a variety of causes, notably infection, faulty metabolism, ductless gland disorders, anaphylaxis, and focal infections. The psychoneuroses, hysteria, neurasthenia, multiple personality and psychasthenia are not diseases, only clinical syndromes, and are manifestations of disorders of personality resulting from exhausting illnesses, stress, and strain incident to a failure of adaptation to life and environment. "The whole of life," says Herbert Spencer, "is an adjustment—a continuous adjustment of inner to outer relations."

Kraepelin¹⁴ formulated his epoch-making views regarding insanity twenty-eight years ago, differentiating at the time, on the basis of their symptoms, between dementia precox† and manic-depressive insanity. He regarded the prognosis in the former as bad, in the latter as good. Later writers, notably Bleuler, have discounted his pessimistic conception of dementia precox, and have in addition clarified our knowledge of this great subject. Bleuler designated all the adolescent mental disorders, with the exception of manic-depressive insanity, as schizophrenia. In the schizophrenic reaction are included dementia precox, the paranoid states, hallucinosis, and the abnormalities of personality, all of which spring from an underlying basic degenerative taint. Necessarily, the widely varying factors entering into the schizo-

phrenic reaction present a greatly differing prognosis from that of a classical precox. A dramatic illustration of the part heredity plays in the evolution of insanity is described by Bonhoeffer,¹⁵ who had charge of 10,000 Serbian prisoners during the Great War. Notwithstanding that they were subjected to every form of stress from disease, famine and hardship, there developed in these soldiers only five cases of insanity. It is far from my purpose to discuss the adolescent or any other form of psychosis, but rather to call attention to the great importance of prognosis in insanity, and also to protest against our making as in the past the prognosis depend upon the clinical group in which they may happen to be classified. It is the usual thing after the diagnosis of a dementia precox to shrug the shoulders and say, "Oh, it is a precox—the prognosis is hopeless and therapy futile." Almost universally, medical men believe that after recovery from manic-depressive and schizophrenic psychoses, recurrence and mental deterioration are inevitable. As Rosanoff and Bergman have shown, this is not necessarily so. In their report of eight cases of these psychoses (seven women and one man) in which they followed each individual after-history for thirty or forty years, there was no second attack. The percentage of permanent recoveries, if carefully searched for, would be much greater than we have suspected. This spirit of medical hopelessness is not justified by the facts, either as regards prognosis or hereditary taint. The pessimism of Kraepelin concerning the former, experience fails to confirm, while the studies of Canavon have shown that the latter is not as dominant as commonly believed. An investigation of 381 offspring of dementia precox patients revealed astonishingly few mental peculiarities, 77.4 per cent being normal. It must be noted, however, that in some children the precox age had not been reached.

This archaic conception of the psychoses represents the past, but it is not the attitude of the neuropsychiatrist of today regarding these adolescent mental states. McCarthy believes that a large proportion of adolescent mental disorders get well, and the Trenton workers report from 60 to 80 per cent of recoveries. Prognosis no longer should be governed by nosological grouping. Adolph Myer has pointed out that the old views have "largely failed to bring out the most vital factors," and that the possibilities of the future depend

†At one time the diagnosis of dementia precox was made in almost fifty per cent of the admissions to mental hospitals. Now this occurs in about fifteen per cent of the cases. (Ruggles).

entirely upon the reaction type of the individual patient. Prognosis then lies not so much in clinical types as in the manner of reaction to life conditions and environment. Constitutional tendencies may cloud one's future, but faulty adaptation is by far the greater menace. The basic factor in faulty adaptation is the degenerative taint. The ability to adjust is the index of this inadequacy and a reliable guide in prognosis. In addition to the psychic factor the potentialities of endocrine disturbance and focal infection should not be overlooked. To the general practitioner, this matter of prognosis in insanity is a matter of paramount importance since mental affections are of such common occurrence. In Massachusetts, according to Dr. Vernon Briggs,¹⁶ one out of every ten of the adult population at one time or another during his life requires care in a hospital for mental and nervous disorders. In the acute infections, delirium, especially if there is a high temperature, is of common occurrence. Pneumonia is an exception, for in this disease it is uncommon. When present it may be apparently the only symptom, the actual trouble being revealed only by an examination of the chest. Tyson has reported three cases of acute mania following the crisis. In this affection, the acuteness of the excitement, or its duration, bore no relation to the amount of lung invasion. The pneumonia was of asthenic type. The patients were neuropathic, and were under 40 years of age. The manic state was evidently of a toxic nature and the recovery was rapid, yet it must be kept in mind that, aside from toxic insanity, acute infections can give rise to typical syndromes of manic-depressive and dementia precox types. These psychoses in no way differ from the usual manifestations of these affections, the prognosis being favorable or unfavorable, just in proportion to the way in which the patient had been able to adjust himself to the life requirements prior to the inception of his illness.

I have never been able to understand why trauma* of the central nervous system should receive attention so out of proportion to that accorded other forms of bodily injury. The probable reason is the commercial significance of the nervous phenomena supposedly incident to it. This it is that has stimulated the fervid imagination of the ambulance chaser and the cupidity of the liti-

gant, while the monetary cost arising from this assumption of a greater gravity, baseless aside from certain, not frequent, exceptions, has been staggering. This is the lesser evil, the greater by far being the decay of moral fiber and the loss of personal initiative developed in the social order. Wilson¹⁷ pertinently asks whether the influence of trauma has not been greatly over-rated, and whether there is not a true cause for tumors and degenerations as there is for infections to which the nervous system is liable; also, whether etiologically there can be any real difference between nervous disease and other affections of the somatic systems. The answer to this question is found in the results of recent research which indicate that both the acute and so-called progressive degenerative forms of nervous disease arise from an infective process. A patient suffering from scarlet fever or diphtheria may have experienced a trauma, but no one today would attribute the symptoms to this cause, and it is equally unscientific and fallacious to do so in nervous states which in like manner spring from an infectious source. The degenerative nervous diseases, whether they are manifestations of abiotrophy or infection, pursue a typical course. It makes no difference whether their etiology is undetermined or supposedly due to trauma, the latter being active in only a relatively small proportion of the total number of cases. The wider knowledge of today enables us better to appreciate the true scope and real significance of trauma, the result of which, according to Orbison, lies largely in the money sense.

Trauma can only be regarded as a contributory factor. Can it stimulate a pathogenic activity in a latent or innocuous micro-organism, and why is this pathogenity confined so exclusively to nervous disease? As to its lighting up of a process in abeyance, I think this most improbable. As to a tabes, a paresis, or a multiple sclerosis being due to trauma, this, with our present knowledge, we know to be an absurdity. It is more probably the flaming up of a latent infection which happens to occur coincident with the injury. The old idea of a lessened bodily resistance accounting for the setting up of the morbid process is archaic and unscientific. An illustration of a latent condition springing suddenly to the surface is furnished by Charcot. He states that during the siege of Paris in 1870, a French woman saw her husband's horse return riderless from a sortie. Immediately she

*Fracture or punctured wounds of the skull, fracture-dislocation of the spine or intracranial lesion due to grave trauma do not enter into this discussion.

developed a typical paralysis agitans, which was attributed to fright. The recent studies in lethargic encephalitis have indicated to us quite definitely the pathology of Parkinson's disease, making such an explanation impossible. Fright also used to be regarded as one of the cardinal causes of Sydenham's chorea, which we now know to be due to an encephalitis. Wilson, however, takes a more liberal attitude toward trauma as a contributory factor than my observation justifies. Unless symptoms of paresis or tabes develop within 48 hours after injury, he asserts that there can be no causal relation between accident and symptoms. In true nervous trauma there occurs an immediate manifestation of symptoms (Wilson). I am not in sympathy with the present tendency to confine the effects of trauma to simply functional disturbances. Its assigned rôle, however, has been greatly exaggerated. There has been much acrimonious discussion regarding delayed traumatic apoplexy. In the cable car accident in St. Paul many years ago there was a man about 50 years of age. His health prior to his injury was excellent. Immediately afterwards he developed insomnia, associated with headache, and a distressing neuralgia. About three months after his accident he had an apoplectic seizure. Suit was brought against the street car company. The trial was a battle royal, and bitterly contested. One of the largest verdicts ever given in a Ramsey County Court was awarded him. In those days cerebral hyperemia with a recognized syndrome was accorded a place in nervous nosology. This was supposed to have been caused by the accident and was given as an explanation of his symptoms, and was believed to be responsible for the cerebral hemorrhage. At that time our knowledge of cerebral arterial sclerosis was quite primitive and the significance of blood pressure was yet to be revealed. Schaller reports the case of a man who sustained a head trauma. After an interval he developed typical hysterical symptoms. Subsequently he died from an intercurrent disease. Autopsy revealed a hemorrhage in one frontal lobe. In order to establish a causal relation between trauma and nervous phenomena the symptoms must be continuous from the moment of injury. Can a blow on the head cause a brain tumor? Mendel cites six cases, four personal, two from other sources, in which the question of a possible relation between the head injury and the neoplasm arose (Wilson). My own obser-

vations have never suggested to me such a relationship. The countless number of head injuries during the late war would, had it existed, have demonstrated, according to Wilson, such a relationship. He states he has never seen such an instance and that this idea that a head injury can give rise to a tumor is wholly unjustified. While I have never observed any relation between trauma and cerebral tumor, yet between it and a brain cyst the probability of such a relationship the following case would seem to suggest. Many years ago, Dr. Charles A. Wheaton referred a case of epilepsy in a young man to me, apparently traumatic in character. While cutting ice the patient was struck on the head by a crowbar. The immediate symptoms were unimportant. Some six months later he had an epileptiform attack of the grand mal type. After this they occurred with distressing regularity. There were no Jacksonian seizures; the symptoms were characteristically those of an essential epilepsy. The neurological examination was negative, and, since there was no evidence of a focal lesion, I suggested that he be put on the routine treatment for this disease. A year later I again examined him, with negative findings. As treatment failed to control the attacks, I advised exploration over site of injury. Dr. Rogers operated and found a cyst. Recently, Reynolds has reported the case of a girl who was struck on the top of the head by the falling of a heavy screen. The case had been previously diagnosed as an hysteria, in spite of a bulging eyeball and haziness of the nasal margins of the discs. There was in addition some disturbance of sensibility. Operation revealed a well-marked arachnoid cyst across the top of the head. There were no convulsive attacks as in my patient. These, it would appear, depend less on the brain injury than upon inherent nervous instability. "The later falls and injuries," says Clark,¹⁸ "when not the result of unobserved seizures, are but the provoking agents to a convulsive state that seems to have been long hanging fire." Of 241 cases of convulsive attacks due to various causes observed by Ostheimer¹⁹ in ex-service men, 17 per cent were latent epilepsies brought to the surface by war conditions. War was merely a provocative influence, the determining cause being neuropathic tendency. Turner reports that in 18,000 cases of gunshot wounds, or other injuries to the head occurring in warfare, less than 5 per cent developed epilepsy. Holmes and Sar-

gent state that out of 610 cases of gunshot wounds of the head, 6 per cent developed epilepsy. Wilson, in quoting these statistics, says that this percentage is much less than one might expect if trauma played the part usually attributed to it. He commends the opinion of Turner that something more than local tissue alterations are requisite for the production of traumatic epilepsy, and that the determining factor is an inherited or inborn constitutional predisposition to nervous instability and epilepsy. Epilepsy is a syndrome, not a disease. Essential epilepsy is a medical abstraction, not a concrete fact. It is a gratuitous assumption, a theory to explain undetermined etiological factors, probably of many kinds. The distinctive fact to bear in mind is that in epilepsy we are not dealing with a disease but with a clinical ensemble. We have been accustomed to speak of the convulsions in epilepsy as being due to a disruptive cortical discharge, but the experimental work of Pollock²⁰ would seem to indicate that the ganglion cells of both the brain and brain stem possess epileptogenous qualities.

One of the most difficult problems of all medicine is that of the relation of trauma to functional nervous disorders. The perplexity of the medical mind regarding such nervous manifestations as hysteria, neurasthenia, traumatic neurasthenia, psychasthenia, which, as Wilson aptly remarks, possess neither etiologic, symptomatologic nor terminologic agreement, an inchoate group, is as great as it was thirty years ago, when it was dominated by the teaching of Erichsen and Page, which to us today seems very primitive. It is slow to recognize that we are dealing with arbitrary clinical syndromes that have in fact no existence, not with actual types of nervous disease. These syndromes differ from one another only in degree and depend entirely upon inherent nervous instability and environmental stress. The whole gamut of nervous phenomena develops in this way, and the attempt to pigeon-hole it into nervous syndromes in light of the new psychology is most absurd. Experimentally, it has been demonstrated that there is such a thing as spinal concussion. It presents distinctive symptoms such as the lessening or loss of power in the legs, impairment in the organic reflexes; the plantar reflexes may be abolished temporarily or there may occur flexion or extension; the deep reflexes also may be diminished or lost, while conduction of sensation is unimpaired. This may

occur, according to Newton, after motor conduction is lost (Wilson). In the slight cases of spinal concussion, it is impossible to distinguish between the symptoms with an organic base and those purely of a functional character. This is a matter of no importance, because in both instances the prognosis is good. After the symptoms of genuine concussion have all disappeared the nervous phenomena may persist indefinitely. This applies equally to all cases associated with trauma where the element of concussion does not enter. This persistence of symptoms is due to the morbidities of the accident complex in the subconscious reflecting themselves through all the activities of the patient. The genuine concussion syndrome is of infrequent occurrence; the great majority of the cases belong to the purely functional class. In these functional states a physical injury may give rise to less disturbance than a psychical trauma. Some of the most marked alterations of personality are observed in the latter. In dealing with nervous phenomena associated with trauma, two things are to be considered: first, the mental factors basic in the evolution of these nervous disorders; second, the psychobiological reaction peculiar to each individual patient. Functional conditions associated with trauma should be termed disorders of personality. The attempt to classify them as in the past as hysterias, etc., is unscientific, confusing and useless. Schaller tells us that at the time of the earthquake in San Francisco, no true nervous disorders (so-called neurasthenia, hysteria, etc.) developed immediately following it, but some time afterward, in the period of meditation and of suggestion, there were many. This incubation period is equally present in all the manifestations of nervous trauma. It is at this time that a psychic evolution takes place on the part of the patient. There enter into this certain dominant factors, such as adequate compensation, suggestions of friends, and the feeling described by Collier that the accident is a valid excuse for a living at the expense of the former employer. Years of observation have convinced me that in the majority of these "Fight for Compensation" cases, as the Germans call them, there is a subconscious fear, due partly to ignorance, largely to misrepresentation of the evil consequences of trauma, commonly associated with cupidity and moral obliquity. These are the genetic influences, the dominant mental factors in evolution of the so-called trau-

matic neuroses. It is not the initial injury but the injury complex from which these patients suffer. Until recently the medical attitude towards these functional troubles has been that of the court room, and therapeutic results as unsatisfactory as the verdicts of the jury. Either the physician has accepted at full value the patient's interpretations of his symptoms, thus crystallizing and perpetuating the "accident complex," or he has regarded these disorders as imaginary or purposely assumed for a monetary consideration, never for a moment visualizing the great significance of the psychic factor in personality. The springing up of the cults was inevitable, a protest against medical obtuseness and short-sightedness. These differing viewpoints not only are unscientific but are unfair to patient and physician alike, representing as they do the opinions of the past thirty years; they now are archaic and obsolete. Functional nervous diseases either arising from or independent of trauma are the manifestation of what Mott calls genetic inadequacy. They may be regarded as a defense reaction because of the inability of the individual to adapt himself to living conditions as they arise from day to day, and the degree of their severity depends upon the way they have succeeded in their life adjustments. It is the psychobiological conception that enables us to estimate not only all the forces but the handicaps as well that are active in the making of personality. And it is through an intelligent perception of these facts that by explanation, therapeutic suggestion, moral suasion, and kindly sympathy—psychotherapy at its best—that we can change the attitude of the patient toward himself, orient him properly, and substitute normal mental reactions for the abnormal. Positive therapeutic results are obtained which at times are almost startling. One of my patients recently referred to her own case as a neurological conversion.

Several years ago a Montana ranch-man, a typical precox, was brought to me. His illness followed immediately an accident—a runaway—in which he was thrown from the buggy, a wheel passing over his head. Several members of his family had been insane. Trauma did not cause this psychosis; it was latent and brought to the surface by the injury. Observation teaches that trauma, exposure, stress and exhausting illness are simply contributory factors. The real cause is genetic inadequacy; without it insanity would not

occur. The experience of Bonhoeffer's Serbian prisoners and the countless gunshot wounds and head injuries of the late war confirm this assertion. The irritability, apathy, depression, alterations in character and associated abnormalities sometimes observed in head injuries and attributed to pathological cerebral changes induced by them, we now know indicate a latent schizophrenia which traumatism has changed from a potential to a dynamic state.

In my final note I shall discuss sleep as a menace. Michael Foster's definition that sleep is a "blank and a gap in the history of the mind" is old, but not obsolete. Of the many explanations of sleep the electric theory of Duval,²¹ the toxic theory of Pieron, the sarcolactic acid theory of Pryer, the cerebral asphyxia theory of Flugler, the anemic theory of Howell, the fall of blood pressure of different writers, are the more important. The most recent, the most notable, the most promising, is that of the Russian School.²² The cortex, according to this, is the seat of two contending activities—excitation and inhibition. Our behavior represents a balance between these two. "Sleep is a spontaneous irradiation of inhibition over the cortex."

There are some chapters of my professional life I would gladly rewrite, especially those relating to disturbed sleep and terrifying dreams. In many instances these experiences are so distressing that patients regard the coming of night with apprehension, often with terror. They resort to every subterfuge to fight off sleep. This action on their part has seemed to me until recently unreasoning—the senseless vaporings of one lacking in proper nervous control. There are certain medical facts common to all. We know that vitality is at its lowest ebb in the early morning hours and in grave illness it is at this time that death is most likely to occur. Schneider, in a total of nearly 58,000 deaths, found that its occurrence was most usual between 4 and 7 A. M. Watson and Finlayson, dealing with the records of nearly 18,000 deaths, placed the highest mortality between 5 and 6 A. M. (MacWilliam). We know that in normal sleep there is a lowering of blood pressure, a slowing of respiration, circulation and glandular activity, a reduction of bodily temperature and of metabolic processes with a diminution or loss of the reflexes. Different observers record a definite fall of blood pressure varying from 15 to 30 mm. Hg. at the

end of two hours' sleep, rising again in the latter part of the night. In hypertension, Brooks and Carrol have noted a fall of 44 mm. after 2 hours' sleep, to rise on waking to 22 mm. We know that the recumbent position, because of the hydrostatic factor, unless there is a fall in the aortic pressure, increases the tension in the cerebral arteries. The use of the pillow under certain pathologic conditions is a wise provision, both for comfort and safety. There were some things regarding this that until Prof. MacWilliam²³ of Aberdeen published his researches we did not know. We did not know that disturbed sleep and dreams raised the blood pressure and caused grave heart irregularities. Sleep to me has meant quiescence, rejuvenation, restoration of bodily and mental capacities. I had not realized that under certain pathologic conditions it was a tragedy. Sleep, aside from dreams, may be disturbed in various ways. Afferent impulses passing along the pathway of the vegetative nervous system from thorax, abdomen and pelvis are perturbing influences of real import. The emotional tone of our complexes is most disturbing, according to Cannon; it increases the adrenal tide and causes an abnormal reaction. A dream is psychic energy unleashed, without control, acting at caprice. It is the resultant of suppressed complexes or some dominant recent experience manifesting itself in the activities of the subconscious when consciousness is in abeyance. In sleep²⁴ the barriers between the conscious and the subconscious are lowered and these activities rise into consciousness, causing dreams. This invasion of consciousness may be light and leave no memory, or it may lessen the integration of personality so as to leave a dim or vivid memory. A nightmare is a dream dynamic. Freud's theory of dreams is a mental phantasy, ingenious, but unconvincing. When dreams are associated with the somatic impulses traveling sympathetic pathways, their tendency to raise the blood pressure, disturb heart action and rupture cerebral arteries is greatly intensified. When called in the night to see a patient who has had a cerebral hemorrhage, there has arisen in my mind, as in yours, the question asked by Sir Samuel Wilks many years ago, and never answered, "Why should this have happened during sleep?" The same inquiry, says MacWilliam, applies to pulmonary, gastro-intestinal hemorrhages and sudden death in supposedly healthy

persons, all of which frequently have a similar incidence. Had the hemorrhages or death followed emotional stress or muscular strain, the explanation would be apparent, but occurring at a period when systolic pressure is low and arterial tension at a minimum, their occurrence would be inexplicable, were it not that MacWilliam has demonstrated the influence of disturbed sleep and dreams in the causation of hypertension and grave cardiac irregularities, which, occurring in persons with cardio-vascular disease and a weakened myocardium, are sufficient to cause the hemorrhages, anginal attacks or fibrillation of the ventricles. A vivid dream, according to him, may cause a marked rise in the blood pressure with associated circulatory and respiratory disturbances in persons all out of proportion to that caused by ordinary exercise, as in walking, cycling, slow ascent of stairs, mental stress or muscular strain gradually taken. While these somatic accidents are exceptional, the fact that they do occur should ever be kept in mind. All pernicious afferent impulses should be prevented, if possible, and emotional stress eliminated, ever keeping in mind the words of Brutus, "Since Cassius once did whet me against Caesar, I have not slept." In a large majority of our patients, arterial degeneration and myocardial insufficiency does not obtain, but in them the resulting nervous manifestations are nevertheless most distressing. We can be of real service by an intelligent perception of the relation of sleep disturbances to their nervous symptoms, by extending a kindly sympathy, not censure, as in our ignorance we have too commonly done, by guarding the pathway of the vegetative nervous system, by correcting endocrine unbalance and by estimating at their full value the psychic factors that upset the physiological processes in the brain cells. We can in this way correct an hitherto unrecognized clinical condition and by instilling peace and calm in the place of anxiety and unrest, order will spring out of chaos and thus, by a tardy justice, we save our medical souls.

In closing these notes, a quotation from the Harveian Oration of 1923 describes more happily than I am able to do the progress made by medicine during the span of my professional life. "I feel," says Prof. Starling, "that I have had the good fortune to see the sun rise on a darkened world, and that the life of my contemporaries has coincided not with a renaissance but with a new

birth of man's power over his environment and his destinies unparalleled in the whole history of mankind."

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THE KETOGENIC DIET IN THE TREATMENT OF EPILEPSY*

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A preliminary report[†] on the use of a ketogenic diet in the treatment of epilepsy was published recently, and included the results of such treatment in seventeen cases. Of the fifteen patients from whom reports had been received, ten had been free from attacks for from two months to one year, four had shown remarkable improvement, and one had not responded favorably to the treatment. It is proposed at this time to present the further progress of the fifteen patients, and to report the results in the treatment of five additional patients.

The ketogenic diet, as described in the report mentioned,[†] consists of a large amount of fat with minimal amounts of carbohydrate and protein. Its object is to produce a ketosis evidenced by acetone and diacetic acid in the urine. The total calories should not exceed the actual metabolic requirements of the patient. The basal metabolic rate (determined directly, or calculated from the DuBois normal standards) is obtained, and the allowance of food is made to equal 130 to 150 per cent of the basal caloric exchange of twenty-four hours. After a few days of gradual carbohydrate restriction, the patient is put on a diet of from 10 to 15 gm. of carbohydrate a day, 1 gm. of protein for each kilogram of body weight, and sufficient fat to supply the remaining caloric requirement. Provision is made for the vitamins and salts. This diet is not well tolerated if started abruptly.

Newburgh and Marsh proposed a similar diet in the treatment of diabetes mellitus. These authors fed adults diets of carbohydrate, 14 gm., protein, 10 gm., and fat, 90 gm., the total calories amounting to 900 or 1,000. After the urine was sugar-free, the diets were further modified to carbohydrate, 15 to 20 gm., protein, 23 gm., and fat, 140 gm. Some of these patients have been on the high fat diets for more than four years.

Marsh and Waller showed that the lipemia in diabetes was diminished when the patients were fed high fat diets. Thus, in spite of the ingestion

*Read before the Northwest Pediatric Society, August 2, 1924, Rochester, Minnesota.

DIET 1, 967 calories (carbohydrate, 50 gm., protein, 25 gm., and fat, 71 gm.)

<i>Breakfast</i>	<i>Gm.</i>	<i>Dinner</i>	<i>Supper</i>	<i>Gm.</i>
Fruit, 10 per cent,		Clear broth .....1 cupful	Bread, white 10	
Strawberries .....100		(no food value) <i>Gm.</i>	Bacon, weighed uncooked..... 10	
Bread, white 10		Roast beef, lean..... 26	Vegetable, 5 per cent,	
Egg (1), soft boiled.....		Vegetable, 5 per cent,	Asparagus .....100	
Butter 4		Tomatoes 50	Fruit, 10 per cent,	
Milk, whole .....100		String beans 50	Orange 60	
		Fruit, 10 per cent,	Butter 4	
		Peaches .....100	Cream, 40 per cent..... 50	
		Butter 4		
		Cream, 40 per cent..... 50		

DIET 2, 990 calories (carbohydrate, 39 gm., protein, 21 gm., and fat, 80 gm.)

<i>Breakfast</i>	<i>Gm.</i>	<i>Dinner</i>	<i>Supper</i>	<i>Gm.</i>
Fruit, 10 per cent,		Vegetable soup* .....1 cupful	Bacon, weighed uncooked..... 15	
Orange .....100		<i>Gm.</i>	Vegetable, 5 per cent,	
Bread, white 10		Vegetables, 5 per cent,	Spinach .....100	
Egg (1), poached.....		Lettuce 50	Fruit, 10 per cent,	
Butter 9		Cauliflower 50	Peach 20	
Milk, whole .....100		Fruit, 10 per cent,	Butter 4	
		Pineapple 50	Cream, 40 per cent..... 50	
		Cheese, American (pale)..... 10		
		Butter 5		
		Cream, 40 per cent..... 50		

*See Recipe 14, Diabetic Primer.

DIET 3, 1,019 calories (carbohydrate, 20 gm., protein, 20 gm., and fat, 92 gm.)

<i>Breakfast</i>	<i>Gm.</i>	<i>Dinner</i>	<i>Supper</i>	<i>Gm.</i>
Fruit, 10 per cent,		Bacon, weighed uncooked..... 10	Egg yolk 1	
Orange 50		Olmsted bran cake..... 1	Vegetable, 5 per cent,	
Olmsted bran cake*..... 1		Vegetable, 5 per cent,	Spinach .....100	
Omelet (1 egg).....		Celery 25	Olmsted bran cake..... 1	
Butter 6		Tomatoes 75	Fruit, 10 per cent,	
Cream, 40 per cent..... 35		Fruit, 10 per cent,	Peach 30	
		Strawberries 30	Butter 6	
		Butter 7	Cream, 40 per cent..... 30	
		Cream, 40 per cent..... 35		
		Diabetic jello 60		

*See Recipe 9, Diabetic Primer

DIET 4, 1,017 calories (carbohydrate, 10 gm., protein, 18 gm., and fat, 97 gm.)

<i>Breakfast</i>	<i>Gm.</i>	<i>Dinner</i>	<i>Supper</i>	<i>Gm.</i>
Fruit, 10 per cent,		Clear broth .....1 cupful	Clear broth .....1 cupful	
Orange 25		<i>Gm.</i>	<i>Gm.</i>	
Egg (1), scrambled.....		Chicken, roast 24	Bacon, weighed uncooked..... 20	
Butter 6		Vegetable, 5 per cent,	Vegetable, 5 per cent,	
Cream, 40 per cent..... 50		Celery, weighed uncooked.... 50	Lettuce and tomatoes..... 50	
		Butter 5	Butter 5	
		Cream, 40 per cent..... 50	Cream, 40 per cent..... 50	

of abnormally large amounts of fat, there is no increase in the blood fat.

The work of Newburgh, and that of Wilder and Winter, demonstrates the practicability and relative harmlessness of greatly restricted carbohydrate

diets for diabetic patients. Since patients with epilepsy have no evident metabolic disorder, they are even better equipped to metabolize food mixtures such as those here suggested.

Miss Foley, dietitian at the Mayo Clinic, has

submitted sample diets which demonstrate the method of carbohydrate restriction. Attention is also directed to the sample diets given by Newburgh and Marsh.

If desired, the butter allowed in the diet may be added to the clear broth. Saccharine diabetic flavoring and water may be added to the cream to make a more palatable beverage.

Every diet prescription must be created for the individual, varying as do prescriptions for diabetic patients. Patients are given the diet prescription, and then sent to the Diet Kitchen to consult the dietitian, who carefully instructs the child or his guardian as to the purpose of the diet. A Diabetic Primer, which is used as a textbook, is supplied. The general principles of the diet are outlined the first day; then classes are held in which the weighing of food is demonstrated, and the patient given an opportunity to become familiar with the weight and composition of foods, the weight of the servings, and the allowances of carbohydrate, protein, and fat. After several such lessons, the patients or guardians are required to work out sample diets.

Ten patients have now remained free from attacks for periods varying from five to fifteen months. Of the four patients who, at the time of my previous report, had shown marked improvement but not complete relief, two (T. F. and G. K.) have now been entirely free from attacks for three months. The other two patients are still subject to occasional convulsions. One of these, who has had severe mental trauma, suffers from hysteria; it has not been possible to learn whether the ketosis is present in the other patient. The father of the latter has been under treatment for syphilis. The one patient who has shown no improvement is a post-encephalitic, undergoing mental degeneration (as mentioned in the preliminary report).

Five new patients, ranging in age from four to ten years, have been on the ketogenic diet for more than one month. All five, three with petit mal, and two with both petit and grand mal, are entirely free from convulsions. The two latter patients are also receiving luminal.

Five patients, including T. F. and G. K. already mentioned, did not respond immediately to the ketogenic diet, in spite of a severe ketonemia. These patients, therefore, were put to bed on a starvation diet, consisting of three to five oranges

a day and water *ad libitum*. After one week of such starvation, the attacks ceased and the children were again placed on the ketogenic diet. They have remained free from further attacks; T. F. and G. K. have been free for three months each.

All of our patients, except T. F. and G. K., have remained healthy and strong. These two boys each had one gastro-intestinal upset, during which they refused all food for several days. G. K. became weak and lost weight. They were given general diets with restricted carbohydrate, less than 50 gm. a day, for one week, and were then put back on the ketogenic diet. Both remain free from attacks. All of the other children have gained weight, and are reported to be very active mentally.

One patient, R. E., remained on the ketogenic diet for two years; during this time he had three grand mal convulsions. Each attack was preceded by a break in the diet. The last attack occurred fifteen months ago. He was put on a general diet nine months ago, and has had no further difficulty.

J. C. had three attacks during the first two weeks on the diet. Six months later he was given a ratio of 2:1 ketogenic to antiketogenic molecules, and is now approaching a general diet. He has had no attacks for ten months.

CONCLUSIONS

The results of treatment with the ketogenic diet in twenty cases of epilepsy, nine of petit mal, six of grand mal, and five of grand and petit mal, are given. Three of the cases may well be omitted, because the convulsions are better explained on an organic basis. The remaining seventeen patients are now on the diet, and acetone and diacetic acid are evident in the urine. These seventeen patients are entirely free from epileptic convulsions. The most favorable results have occurred in cases of petit mal.

Studies of the blood chemistry have not been completed.

The treatment of epilepsy with the ketogenic diet has given excellent results, and should be given a thorough trial.

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Send for the Hygeia clip-sheet, and use it.—A. M. A. Bulletin, Dec., 1923.

ANOTHER FULL-TIME STATE SECRETARY

The Michigan Medical State Society, at its annual meeting at Mt. Clemens, amended its constitution and by-laws to fix the annual membership dues at \$10. This was done to provide for the employment of a full-time secretary and to enable the society to extend its work and increase its usefulness. Thus the Michigan State Medical Society has again recorded itself as an organization that refuses to stand still or even to move slowly in discharging its recognized duties to its members and its state. It may be confidently predicted that the results attendant on this progressive action will entirely justify it and that the benefits to be derived will not be long in being realized.

Since the West Virginia State Medical Association recently provided for a full-time secretary, too, there are now at least nine state associations with full-time secretaries: Massachusetts, West Virginia, Virginia, Wisconsin, Ohio, Texas, Missouri, California and Michigan. Pennsylvania has a secretary and a full-time executive secretary.—*A. M. A. Bulletin, October, 1924.*

REMINISCENCES OF THIRTY YEARS AGO*

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Mr. President, and Gentlemen:

When called upon, by the program committee, to prepare a paper for this evening, I spent considerable time trying to select a suitable subject. And realizing that the scientific subjects could be handled very much better by other members of the society, I finally decided to go back thirty years and give you some of the impressions, made upon the "callow mind" of an interne, which time has failed to efface.

We hear and read daily of the wonderful work being done by the leading men of the profession today, but do we ever stop to think that they are only carrying on, a little farther, the work begun thirty or thirty-five years ago by those pioneers, some of whom it is my intention to mention to-night. The advances made in laboratory facilities and the use of the x-ray have made the matter of diagnosis exceedingly simple as compared with the methods in vogue at the time about which I am writing. The men of that day had to depend upon touch, sight and hearing together with a good knowledge of human nature and a large amount of common sense in arriving at a diagnosis. Yet, I stand ready to affirm that, with only their limited facilities, their work compares favorably with that being done today, and in some respects excelling a considerable amount of what is called surgery as we see it now. Did you know that the first operation, performed in this country, for the removal of a goiter was performed by Dr. Knute Hoegh of Minneapolis more than thirty years ago? That the first cholecystotomy in the state was done by a St. Paul surgeon, Dr. Justus Ohage, more than thirty-two years ago?

I could enumerate a number of operations, which are quite common today, that were performed by these pioneers in surgery and with very little difference in technique. However, I am not going to give you a scientific dissertation on the surgery of thirty years ago as compared with that done today, but am going to give you some of the personalities of a few of the surgeons with whom I came in contact while serving my internship at St. Joseph's

*Presented before the Northern Minnesota Medical Association, Duluth, August, 1924.

Hospital, St. Paul. in 1893. This was during what may be called the antiseptic period of medicine, as more attention was paid to antisepsis than asepsis. Dr. W. W. Price was the leader in the introduction of asepsis, but it had not, then, been generally adopted in the west.

The first man I am going to mention is Dr. J. H. Murphy. He was of the "old school," a graduate of Rush Medical School at the time they turned out finished M.D.'s after a twelve weeks' course, to get the most of their training on their fellow men. He soon enlisted, after graduation, in the U. S. Army and served as a surgeon throughout the Civil War. At the time I first met him he was surgeon for four railroads and of one was surgeon-in-chief. He worked only on the extremities, as the abdomen was a *terra incognita* to him. He was a large, portly man and always wore a Prince Albert coat with a high silk hat. If he did not get what he called laudable pus in a wound after operation something was the matter. When an accident case from the railroad shops came in, Dr. Murphy usually arrived before the ambulance. Hurrying into the emergency operating room, he would take off his coat, roll up his sleeves and, opening his old kit bag, extract from it a large rubber apron, which he would don. Then he would fish out an old operating case and take from it a large scalpel, two or three needles, a spool of silk thread and one or two pairs of artery forceps and a pair of scissors, all of which he would lay out on a small table near the operating table. Then, scalpel in hand, he would go out in the hall and wait for the patient to arrive. He would then, as soon as the patient was asleep, start in cutting and fixing up the injury. Our surgical nurse, who was a graduate of the Presbyterian Hospital of Chicago, would stand by with the nozzle of a 5-gallon irrigator full of a bichloride solution and turn the stream on the field of operation until the wrath of the doctor would rise and he would tell her to turn off that squirt gun as he did not want to be drowned. Finishing the operation he would tell us to put on a dressing and would himself wipe his instruments on his sleeve and return them to his bag ready for another emergency. As a prognostician he was excelled by few. He was a kindly old gentleman, who knew his limitations, but was too old to adapt himself to the new order of things. One other incident in connection with Dr. Murphy and I will pass on to others. When he was taken with the

illness which resulted in his death, he called a consultation of all the leading doctors in the Twin Cities. They decided that an operation for the relief of the carbuncles with which he was afflicted would have to be performed and left it to him to select the operator. He chose an eye and ear man to do the work.

We had an unusual opportunity at St. Joseph's to observe the different methods illustrative of the different countries in which the doctors had received their training. From Norway we had the brilliant Dr. Harold Graff, whose post-operative care of his patients could not be excelled. He once told me that he had spent ten years intensive study in the hospitals before he ever attempted to operate. His death was as dramatic as his life was erratic. I can well remember the deputy coroner calling me up and asking me to assist him at an inquest and, upon arriving at the place, being told that Dr. Graff was the subject. The body was lying on a couch and nearby stood a table, with a large hypodermic syringe, not quite empty, lying on it. Upon examining the body we found that he had carefully injected cocaine solution into the skin over the heart and then had thrust an amputating catlin into that organ, causing instant death. Whiskey and domestic trouble proved more than he could stand. Among the doctors educated in Germany we had Dr. Justus Ohage, who was as jealous of his reputation as a young girl of her first beau. He was and is a skillful operator and performed a large number of gallbladder operations, several resections, and made common use of the "Senn" bone plates in those years. Dr. Arnold Schwyzer, still living, was and is a surgeon from whose work the very best can derive many valuable lessons. An exceptionally fine pathologist, and clever operator, I would advise all of you gentlemen never to neglect to see him work, if you have the opportunity. Dr. Canac Marquis, educated in Paris, exhibited all the excitable tactics of the French. His motto was, "Cut and tie afterwards." He was a bold and a bloody operator, yet one could not help but admire his fearlessness in his work.

I now come to the men educated in America. Alex J. Stone, M.A., M.D., LL.D., was well known internationally as well as in this country, as one of the leading gynecologists. He was considered in the class with Sims, Munde, Thomas and some others. He was one of the wittiest, as well as one of the best clinical instructors of his day. He was

always ready to extend a helping hand to assist a needy student or brother practitioner, and was one of "God's own noblemen." The world is the better for his having lived. An instance illustrates his interest in the students. At some time in his earlier career, he met with an accident, a horse falling with him and dislocating his leg at the hip. It was not replaced for some time for some reason and afterward he could, by a sudden twist, dislocate it again. I have seen him voluntarily do this painful procedure, before a class of students, to illustrate upward and backward dislocation for their benefit. Dr. Archibald MacLaren,* known to you all, was at this time coming into his own and by his careful, scientific methods advancing to the place he holds today. He was the coolest man that ever leaned over a patient on an operating table. Nothing could excite or hurry him. Always exact and by his follow-up methods keeping in touch with his cases after they had left his hands, he was able to correct details in technique and profit by his experience. You can no longer wonder at his success.

The last of the St. Paul men I am going to mention, as I have not the time nor you the patience to listen to a detail of the various specialists, is Dr. C. A. Wheaton. When he was a young man he was employed as baggageman on the Milwaukee R. R., and, while on a hunting trip, was accidentally shot in the hip. He very nearly bled to death before assistance could be obtained. This made such an impression on him that he resolved to study medicine, which he forthwith did. Graduating from Harvard Medical College, he became professor of anatomy in the St. Paul College of Medicine, which position he held until its affiliation with the University. He there laid the foundation for his skill as a surgeon. He became the leading surgeon in the state and his services were in great demand. He had a great personality and could inspire confidence in the most despondent patient. Always jealous of his reputation, he never left any loopholes for trouble to creep in. He watched the progress of his assistants just as carefully and never left any stone unturned to perfect them in their chosen field. Many a young doctor can point to the foundation of his success in the instruction received from him.

Among the Minneapolis surgeons with whom I came in contact while a student in the office of

Dr. James H. Dunn, I will mention Dr. Knute Hoegh, a graduate of the University of King Fredrick, Norway, in 1859. He practiced at several points, finally locating in Minneapolis, where he enjoyed a very large practice. He was an exceptionally good diagnostician and more than an average surgeon. He was a very witty man and his sallies were so unexpected. To illustrate, while temporarily acting as interne at St. Mary's Hospital, it was my painful duty to inform him one morning, upon his arrival at the hospital, that one of his medical cases had died during the night. He stood for a moment or two, then said, "My medical cases are in the hands of the Lord; but my surgical cases I have something to say about them." On another occasion, when in consultation with a very young doctor, noting the anxiety on the part of the young man, he took him by the shoulder and said: "Ninety-five per cent of all medical cases will get well without any medicine, and I have my doubts of the other 5 per cent." He had a very bad temper which he never tried to control, and which very frequently got him into bad predicaments. Once, his assistant having forgotten to bring from the office a certain instrument which he needed, he let himself loose, abusing everyone present; the hospital interne faced him and told him not to say anything to him or he would shove his fist down his throat, that he had always treated him as a gentleman and expected the same from him. Dr. Hoegh looked him up and down and said, "I guess you can do it, I apologize," and everything was lovely again. While with Dr. Dunn I witnessed an unusual performance, namely, four separate operations, performed by four surgeons on the same patient at the same time. The patient belonged to Dr. Hoegh. She had tuberculous enlargement of the glands in both groins and in both sides of the neck. Owing to her weakened condition, the patient could not stand a prolonged operation, or more than one, so Dr. Hoegh secured three of the leading surgeons to help him. Dr. Dunn and Dr. J. E. Moore operated on the groins while Dr. Dunsmoor and Dr. Hoegh operated on the neck. The patient lived. Dr. Hoegh was a born clinical instructor and it was unfortunate that petty jealousy of one or two men kept him off of the staff at the University. He used to hold private clinics to which he invited a few students and I am sure they will never forget the large amount of valuable instruction he

*The death of Dr. MacLaren occurred Oct. 12, 1924.

gave them. Dr. J. E. Moore, or "Little Dr. Moore," as he was called to distinguish him from Dr. J. T. Moore, was at this time an orthopedic surgeon. He was very rapid in his work. I have seen him amputate a leg when it took only forty-five seconds from the time he made his first incision until the limb was severed and he was ready to tie the arteries. Some record! It was always a pleasure to see him work.

Dr. James H. Dunn, with whom I served a term while a student, was probably the finest diagnostician in the Northwest. He was thoroughly prepared for work in his chosen field, and had rare good judgment. He often said it was not how, but when to cut, that counted. His continued hard study and the extremely large amount of work he did, proved too much for his delicate physique, especially after a narrow escape from death from blood poisoning had weakened him. The profession lost one of its most valuable members when he dropped dead at the meeting of the American Medical Association at St. Louis.

I have mentioned only a few of the leading men of thirty years ago, for there were many more. These men worked under a great handicap. Dr. Boeckmann had not invented his sterilizer which revolutionized the preparation of dressings. Nor had he perfected his process for sterilizing by dry heat, upon which the surgeons of today depend for sterilization of ligatures and sutures. Silk was used almost exclusively for buried sutures and they very often caused trouble. The catgut ligatures prepared in those days by immersion in a strong antiseptic solution had a tendency to break, the antiseptics destroying the strength, and they were not always sterile. The mortality among the operative cases was very little higher than now. I will say in conclusion, that we should honor the memory of these pioneers in surgery, and may we all profit by the good work performed by them.

Gentlemen, I thank you for your kind attention.

THE FORTHCOMING U. S. PHARMACOPEIA

The committee elected in May, 1920, for the revision of the United States Pharmacopeia has practically completed its work. The responsibility for the scope of the new book was placed on the twenty-one physician members of the committee so that the new edition should be more fully representative of the therapeutically valuable drugs than formerly. The number of medicinal substances to be included in the book is less than 650.—(*Jour. A. M. A., Sept. 20, 1924, p. 923.*)

THE USE OF FULL THICKNESS SKIN GRAFTS*

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and

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Free, full thickness skin grafts have been used for many years, but, owing to the low percentage of good results following their use, a great many surgeons have gradually abandoned them. On removing the dressing from three to four days after operation the graft usually appeared to be doing well, but in a few days it gradually began to grow dark, and ultimately sloughed.

Keller first called our attention to the value of large, full thickness skin grafts, emphasizing the use of dental modeling compound as one essential in obtaining even pressure over the graft. Parce, in 1922, working with Keller, reported eight cases, and pointed out the use of such grafts in scars and contractions about the arms and feet following war injuries. In one of his cases a graft was applied to an anus after the removal of an epithelioma.

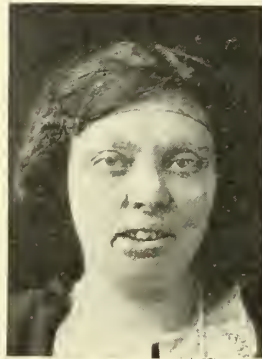


Fig. 1 (Case A460282). Ectropion of the lower lip from a burn.

Fig. 2 (Case A460282). Postoperative. A full thickness skin graft has been inserted after a portion of the mucous membrane, as well as the scar, has been excised.

We have used full thickness grafts around the face and neck whenever there was sufficient supporting tissue to allow firm pressure after operation, such as in filling in the defect after excision of scars, or following the excision of an inactive basal cell epithelioma if a plastic closure was not

*Read before the meeting of the Northern Minnesota Medical Association, Duluth, August 4-5, 1924.

possible, in correcting ectropion of the lips, and in grafting the distal end of a pedicled flap if a double epithelized flap was essential, as in reconstructing the nose, cheek, or lower lip. We have also used the grafts in replacing large, pigmented, hairy moles on the face, and by means of a rubber



Fig. 3 (Case A463452). Low grade epithelioma of the forehead and bridge of the nose.

Fig. 4 (Case A463452). Postoperative. The epithelioma was excised and immediately replaced with a full thickness skin graft.

tube, in lining scarred-down nostrils. Usually they have been applied to clean wounds, but when used in correcting ectropion of the lower lip, slight secondary infection has sometimes occurred, due to the location.

Local anesthesia is used, as a rule, except for children, both in removing the graft and in preparing the area to be grafted. At first it was feared that the local anesthesia might interfere with the success of the graft, but the grafts do as well with local anesthesia as with general.

The area to be grafted must be freed from fat as much as possible, so that on the neck it is best to get down to muscle or some such tissue to make a bed for the graft. In order to render the area to be grafted as dry as possible, the vessels are pinched off with forceps and the oozing controlled with hot sponges. Very little catgut is used, as it tends to prevent the accurate approximation of the graft to the underlying tissues. The margin around the area to be grafted is undermined so that it may be approximated accurately with the margin of the graft.

Small grafts for the face can be best obtained from the posterior cervical region, as the color of the skin is more like that of the face than that in other parts of the body. The larger grafts are taken from the thigh or upper arm. Round or oval grafts are more accurately approximated to

the margins of the area to be grafted. The full thickness grafts, the thickness of the true skin, are dissected with a knife and cut as thin as possible, care being taken to avoid fat. If small areas of fat are attached to the graft, these are cut away with scissors. If hair-bearing skin is to be used, a deeper graft is necessary, but the chance of success is not nearly so good as with the usual thin, full thickness graft. The graft is cut as nearly as possible the size of the area to be grafted so that in its new position it will be under normal tension. A pattern of the area to be grafted may be made with rubber tissue, or it may be measured. We have used grafts as large as 7.5 cm. in diameter, but it is not advisable to use larger grafts on account of the difficulty in maintaining even pressure over the entire area. It is better to apply several small grafts at different times than to attempt a large one, especially on the neck. The graft is sutured in place accurately with dermal sutures, and is not perforated. Several layers of gauze, about 1.5 cm. in thickness, just a little larger than the graft, are applied and firm pressure made by means of adhesive plaster, thus splinting the graft in its new position.

The dressing is not touched for ten days, and then, in order not to disturb the graft, is removed carefully in layers. As a rule, the graft will have adhered perfectly, and require no further treatment. The wound is left open to the air and protected for



Fig. 5 (Case A460095). A dark pigmented scar of the cheek from a burn.

Fig. 6 (Case A460095). Postoperative. The greater part of the scar was excised and replaced with a full thickness skin graft.

a time with a wire mesh basket. If the graft is applied over the malar bone, the forehead, or the bridge of the nose, a small slough may occur over the most prominent bony point if too much pressure is applied. Sometimes one or two small

superficial areas may slough and make it necessary to dissect them off; these areas will epithelize themselves. If this technic is followed, the greater number of full thickness grafts will be successful.



Fig. 7 (Case A234391). Scarring of the neck and chin from a burn. Note the very short neck.

Fig. 8 (Case A234391). Patient six years later, following the use of radium and full thickness skin grafts over the neck. Later a full thickness skin graft will be used to correct the ectropion of the lip.

We have found that dental compounds, applied directly to the graft, tend to macerate it, and therefore we prefer the gauze. Blair uses silk sea-sponge for pressure. The sponge is applied moist, and when removed is quite dry and hard. Davis recommends silver foil and dry gauze, or gauze kept moist constantly with salt solution, or a flexible paraffin mixture such as ambrine. He believes that the area should be immobilized until the blood supply of the graft is assured, and the parts protected from trauma for about six weeks.

If the area to be grafted is on the neck, the patient is kept flat on his back for at least ten days, with shot bags on either side of the neck, which aid in keeping the part absolutely immobilized. It is not advisable, as a rule, to try full thickness grafts on the necks of very young children because of the difficulty in keeping the part quiet for the necessary period, but if they are attempted, the child should be put in a Bradford frame.

Full thickness grafts, in suitable locations, have certain definite advantages over the pedicled flaps. As a rule, the patient is in the hospital about ten days or two weeks, whereas if a pedicled flap is used, the hospitalization period is usually from six weeks to two months, the full thickness graft saving the patient much time and expense. Also, there is much less possibility of infection, as the operation is done in one stage. The tissue lies flat and is under tension in its new position, whereas in the pedicled flaps the tissue is usually thickened

like a pillow. Full thickness grafts have certain advantages over Thiersch grafts when used in locations in which they are indicated. They give much more body to the pedicled flaps than the Thiersch grafts, preventing them from drawing up on themselves. Around the face the cosmetic result is much better, the color and the thickness of the skin being more like the surrounding tissue. In some cases there is slight pigmentation for the first few months, but in most cases the color is so nearly normal that ultimately it is difficult to tell the graft from the surrounding tissue (Figs. 1 to 10).



Fig. 9 (Case A437320). Scarring of the neck and ectropion of the lower lip from a burn.

Fig. 10 (Case A437320). Postoperative. A full thickness skin graft has been inserted in the anterior part of the neck, after excision of the scarring. Part of the mucous membrane of the lower lip, as well as a portion of the skin, has been excised and replaced with a full thickness skin graft to correct the ectropion.

CONCLUSION

Full thickness grafts are of definite value if used on the face and neck where firm pressure can be applied. The essential points are: (1) a clean, dry wound, free from fat, (2) a graft free from fat, the same size and shape as the area to be grafted, (3) accurate suturing of the graft, (4) firm pressure applied with gauze for at least ten days, and (5) immobilization of the parts during this time.

Did you ever stop to think that the names of diseases and the names of flowers are very similar? For instance, I might say, "Do come and see my garden. It is at its best now, and the double pneumonias are really wonderful. I suppose the mild winter had something to do with that. I'm very proud of my trailing phlebitis, too, and the laryngitis and deep purple quinsies that I put in last year are a joy to behold. The bed of asthmas and malarias that you used to admire is finer than ever this summer, and the dear little dropsies are all in bloom down by the lake, and make such a pretty showing with the blue of the anthrax border behind them!"—From *Madame Claire*, by Susan Ertz.

A RATIONAL AND SIMPLE METHOD OF FEEDING CHILDREN DURING THE FIRST TWO YEARS OF LIFE

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When one considers the great rapidity with which growth occurs normally during the first two years of life and also the prevalence of nutritional and gastro-intestinal disturbances during this period, the importance of the proper supervision of the diet of young children becomes apparent. It is physically impossible and probably not desirable for this important phase of preventive medicine to be undertaken exclusively by the few physicians limiting their practice to pediatrics. Undoubtedly the vast majority of mothers must rely upon their family physician for common-sense supervision of diets for their children. This affords the physician an opportunity to exert an educational influence in his community which should result in better and healthier babies. It is undoubtedly highly desirable that young mothers and also those with experience should obtain information regarding the care of their children from the informed and experienced physician rather than from a well meaning but uninformed neighbor or friend.

Physicians rendering very high-class service in general practice have informed us that in general they give better service to sick infants than they do to well babies, and feel that a simple outline of feeding for children during the first two years of life would equip them to offer well baby care to their patients. The purpose of this paper is to attempt to meet this need.

Mother's milk is undoubtedly the safest and most satisfactory food for the infant during the first few months of life, and every physician should do his utmost to encourage maternal nursing. In general, clock-like regularity of the frequency of nursing is desirable, and for the majority of infants the four-hour interval between nursings proves very satisfactory and entirely meets the needs of the infant. In some instances, however, shorter intervals between nursing periods prove more satisfactory, although it is seldom necessary

to put the baby to breast oftener than every three hours. As a rule, if the physician instructs the mother to nurse the baby at stated intervals, to awaken it if necessary when the feeding time comes, and not to feed the baby when it cries, the instructions are followed.

For convenience and simplicity in the feeding directions outlined in this paper the four-hour interval is adopted. The same schedule, however, may be adopted when dealing with infants fed more frequently by merely adjusting the hours at which solid foods are given.

In general, four to six hours after birth the baby is taken to breast and permitted to nurse for twenty minutes. As a rule only one breast is nursed at each feeding, and in most instances after lactation is established sufficient milk is obtained from one breast to meet the infant's needs. If the baby is weighed every five minutes while nursing, one finds that the greatest amount of milk is obtained during the first five minutes. After twenty minutes at the breast very little or no milk is obtained, and if weighings are continued at five-minute intervals the surprising discovery is made that the baby actually loses slightly in weight. This loss results probably from the fact that the infant obtained nothing at the breast, and during this interval lost a measurable amount of fluid by evaporation from the skin and also through the expired air. If the physician tries this experiment he will soon be convinced that nothing is accomplished by permitting the infant to nurse much longer than twenty minutes. The normal baby receiving an adequate amount of breast milk will thrive when fed every four hours, permitting only five feedings in twenty-four hours. Many infants will sleep the entire night without nursing between ten P. M. and six A. M. However, if the baby requires a night feeding it should be permitted. Under normal conditions the baby may be fed exclusively on mother's milk until six months of age. After this age the following schedule may be followed:

SIX MONTHS

- 6 A. M. Nurse
- 10 A. M. Farina or cream of wheat; nurse
- 2 P. M. Nurse
- 6 P. M. Farina or cream of wheat; nurse
- 10 P. M. Nurse

Cook cereal three hours, season with salt and add a little sugar.

Feed cereal thick, starting with one teaspoonful and increase gradually to three or four tablespoonfuls twice daily.

SEVEN MONTHS

- 6 A. M. Nurse.
 10 A. M. Farina or oatmeal; nurse
 2 P. M. Carrots, spinach, swiss chard, peas or cocked head lettuce; nurse
 Cook vegetables until tender, season with salt and strain; do not throw water away. Start with one teaspoonful and increase gradually to 3 to 5 tablespoonfuls
 6 P. M. Farina or oatmeal; nurse
 10 P. M. Nurse

EIGHT MONTHS

- 6 A. M. Nurse
 10 A. M. Cereal, toast, buttered, 5 to 6 ounces of boiled, whole cow's milk
 2 P. M. Carrots, peas, spinach, chard or head lettuce. Baked potatoes, meat broth with fat skimmed off, vegetable soup; nurse
 6 P. M. Cereal, toast, buttered, five to six ounces boiled, whole cow's milk
 10 P. M. Nurse
 At eight months start weaning gradually by omitting two nursings

NINE MONTHS

- 6 A. M. Nurse
 10 A. M. Any cooked cereal, toast, six ounces boiled cow's milk
 2 P. M. Carrots, peas, spinach, head lettuce, Swiss chard, tomatoes (cooked), asparagus tips, vegetable soup, baked or mashed potatoes, stewed prunes, baked apple or apple sauce. Six ounces boiled milk
 6 P. M. Cooked cereal, toast, six ounces boiled milk
 10 P. M. Nurse
 At nine months the 10 P. M. nursing may be omitted in many instances

TEN MONTHS

- 7:30 A. M. Cereal, toast, prunes, six to seven ounces boiled milk
 12:30 P. M. Cooked carrots, peas, spinach, Swiss chard, head lettuce, string beans, asparagus tips, cauliflower, tomatoes, celery, Brussels sprouts, baked

egg plant, vegetable soup, meat broth, baked apple, apple sauce, baked or mashed potatoes, six to seven ounces boiled milk

Do not permit any morning lunch between 7:30 and 12:30

3:30 P. M. Orange, toast or zwieback

6:30 P. M. Cereal, vegetable soup, toast, six to seven ounces boiled milk

The majority of babies may be weaned at 10 months of age

TWELVE MONTHS

Add stewed peaches, apricots, apple butter, jam, baked banana, rice, scraped, or ground beef

FIFTEEN MONTHS

Add bread and butter, jelly, jello, cottage cheese, junket, bacon, fried crisp. At fifteen months of age vegetables do not need to be strained

EIGHTEEN MONTHS

Add roast beef, veal or lamb chop, mutton stew, sweetbreads, chicken and other fowl, broiled veal liver, fish, salmon, scraped raw apple. Do not give ham or pork or cured meats

TWENTY-TWO TO TWENTY-FOUR MONTHS

Add poached or soft boiled eggs, simple cookies, desserts containing eggs, tapioca, custard, bread pudding

The above method of feeding children, with minor alterations, is in general use in Minneapolis. Readers undoubtedly will notice that it differs in some details from methods which they employ successfully. The purpose of this paper is not to offer this schedule as the only method of properly adjusting the diet of infants, for the one and only method of feeding normal children does not exist. The adoption of this or some similar systematic plan of directing the diet during the first two years of life is recommended, however, to enable the physician to employ a rational simple and tested method for "well baby care" which will promote proper nutrition and good health for his young patients. At first the physician not accustomed to directing the diet of infants may find reference to the schedule necessary, but with continued use

of a systematic plan, outlining the changes from month to month becomes as easy and commonplace as writing a simple prescription. After thorough familiarity is obtained as to the results obtained through systematic supervision of the diet, the physician will find that through this growing experience, modifications of this simple schedule may be made to meet practically all his needs.

Probably the most common alteration of the dietary regime to be made is the addition of cereal to the diet before the sixth month, for Farina may be given safely as early as the second month, or earlier. In this manner the giving of artificial milk mixtures, which often encourage weaning the baby, may be avoided, and moderate deficiencies in the amount of breast milk may be offset by the simple administration of cereal.

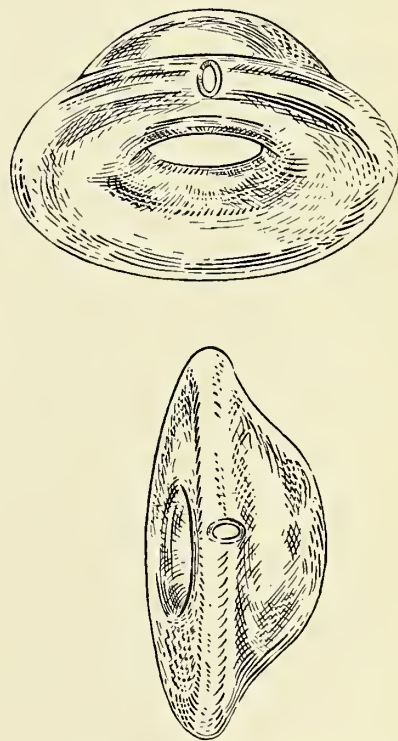
Various other modifications of the diet schedule may also be profitably made when dealing with individual cases, and success in feeding babies will increase with growing experience on the part of the physician in the early addition of solid foods to the diet.

Even under the most favorable circumstances, however, one must occasionally resort to complementary feedings, for which simple dilutions of cow's milk often suffice. For advice as to advisability of using milk mixtures the mother undoubtedly should rely upon the directions of her physician rather than upon directions printed upon the containers of proprietary artificial foods.

The difficulties confronting maternal nursing are almost too numerous to mention, although attention may be called to the solution of a few of these problems. The practice of examining the quality of breast milk is obsolete. A thorough and complete analysis of breast milk in individual cases would undoubtedly consume so much time that by its completion the child would have attained the age of weaning. One can more profitably direct his efforts in determining the maximum amount of milk the individual mother can supply her baby by weighing the infant before and after nursing. If the amount obtained at the breast is inadequate to permit a gain in weight of four to six ounces each week when given both breasts at each feeding, the breasts should be expressed by hand after nursing to make certain that they are completely emptied. Incomplete drainage of the breast favors a diminution in the milk supply if continued over several weeks. Where the baby nurses vigorously

and completely empties the breast only a few drops of milk may be obtained by manual expression. In such instances, the continuance of breast expression is probably of no benefit and not advisable.

Occasionally, considerable breast milk is lost from dripping from the nipple between nursing periods. This may be prevented by wearing glass nipple shells (Fig. 1) collecting this milk in order that it may be given to the baby by bottle or spoon after nursing. The glass shells are applied to the breast with the nipple projecting into the aperture provided for this purpose and are held in position by means of a binder applied snugly around the chest. This very convenient device should be used more widely, for not infrequently patients collect from six to eight ounces of milk daily in this manner. After the third or fourth month of lactation the loss of milk from the breast usually ceases.



GLASS NIPPLE SHELLS

FIG. 1

To promote a maximum supply of breast milk, mothers should indulge in a generous diet without restriction and should be free from worry. In addition, a two hours' rest in bed in the afternoon

and an early hour for retirement at night is advisable.

An insufficient supply of breast milk is no excuse for weaning a baby. Under such circumstances, the infant should receive every drop the mother can supply and be given enough additional food to make up whatever deficiency exists.

In conclusion, it is recommended that all physicians engaged in general practice adopt some simple, rational, tested method of outlining the diet for young children and train their patients to rely upon their own doctor for "well baby care."

In his presidential address before the American Medical Association last June, Dr. William Allen Pusey devoted himself to the subject of the limitation of population, and brought to the support of an argument for birth control most of the familiar facts about the impossibility of supporting the population of the future on the land of the present. "If no effort is made at birth control," said Doctor Pusey, "nature will take charge of the situation by eliminating those less able to resist." Continuing his argument, he cited the contention of the economists that those people inherit the earth who multiply most rapidly, and that fecundity increases inversely according to the individual's position in the social scale. It seemed to him, as it has seemed to others, that this means the downfall of modern Christian civilization, with the triumph of the misery and degradation of Asia. "I particularly desire," he concluded, "that the mistaken impression should not go out that I mean to say that medicine now has any satisfactory program for birth control. It has not."

In the tomes of the ardent economists, biologists, sociologists and philosophers who favor birth control, the eager reader will also search futilely for any practical program, or, indeed, for any practical method. His disappointment will not, moreover, depend entirely on the fact that our government, either wisely or unwisely, has made unlawful the dissemination of such knowledge as is available. The fact is that none of the students of the problem, not even the physicians, have ever perfected any method of birth control that is physiologically, psychologically and biologically sound in both principle and practice. Not, of course, that devices for the prevention of conception do not exist; it is well known that they do, and that they are easily available to almost any purchaser in any drug-store in America. The difficulty lies primarily in the imperfection of the devices themselves, and in the peculiar psychology of that lower stratum of society which the birth-control enthusiasts insist must be brought to the light, lest its descendants inherit the earth.—*Morris Fishbein, The American Mercury.*

THE HISTORY AND PRESENT STATUS OF THE NON-SURGICAL TREATMENT OF HEMORRHOIDS*

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The non-surgical treatment of hemorrhoids is not new. It has been described and used for many years. It is only new in the sense that the profession as a whole has very little real knowledge concerning it. The first method of non-surgical cure advanced was that of electrolysis. This procedure originated in Germany over a hundred years ago, but with the advent of aseptic surgery was more or less forgotten. Sir Charles Ball of Dublin later described the method and in 1891 an article by Newman appeared in the Journal of the American Medical Association. As far as I can ascertain, this is the first reference to the subject in American literature. More recently very comprehensive papers have been published by C. C. Mechling of Pittsburgh and H. E. Dunne of Washington. The injection method of treatment is of American origin. In fact, in Europe it is frequently known as the American method. It dates back to 1891, when it was first advocated and employed by a Dr. Mitchell of Illinois. Since that time, more particularly in the last ten or fifteen years, there have been numerous descriptions of the method appearing in both domestic and foreign medical publications.

That the method has not been more widely adopted is in my opinion due to two factors: first, a lack of adequate information concerning the treatment, and, second, to prejudice which has been handed down from one medical generation to the next. When the injection method was first devised the profession as a whole gave it but little attention and waited for the proof of time. Unfortunately, the quacks were quick to see that the people in general would welcome any method which was said to cure with little pain and without operation. Literally hundreds of irregulars went about the country making preposterous claims and injecting all who came their way. They were frequently unscrupulous and of little medical attainment. Their knowledge of rectal diseases and aseptics was

*Presented at the meeting of the Northern Minnesota Medical Association, Duluth, August, 1924.

limited. The natural results were numerous complications and some deaths. The remarkable thing is that even under these conditions numerous cures were produced.

Had there been any considerable number of ethical physicians practicing proctology at that time no doubt the matter would have received thorough investigation and its real value determined. Unfortunately, this was not the case. Rectal surgery was being done almost entirely by the general surgeons. None of them saw any great volume and regarded it as of rather minor importance. Therefore, they performed the routine operation which gave fairly good results and gave the matter no further investigation. Of the non-operative treatment they had little real knowledge. They saw only the cases where the results were bad. Basing their conclusions on these and upon the type of men employing the non-surgical method they condemned it. As they were also teaching proctology in the medical colleges they passed their opinions on to their medical students, who, of course, took the statement for its face value. Thus, without adequate investigation, this idea was spread through the whole profession.

However, time produces changes. An increasing number of reputable medical men began to limit their practice to proctology. Medical colleges, recognizing the need of more thorough instruction in this field, began to offer courses in rectal diseases. The courses offered were (and still are) inadequate, but they were an improvement. More thorough research was made in rectal diseases. Many old theories were exploded. Among other matters investigated was the non-surgical treatment of hemorrhoids. It was found to have real merit and in the past ten years has grown greatly in favor. This real increase in interest probably dates from a paper given by Dr. Terrell of Richmond in 1914, in which he advocated the use of quinine urea hydrochloride. Since that time it is safe to say that, insofar as the American Proctologic Society is concerned, at least 80 per cent of its members use it to a greater or less extent.

Briefly stated, just what is the principle of the non-operative methods? A hemorrhoid is in a general way the same as an angioma or nevus elsewhere in the body. It is like a sponge filled with water. When the blood is squeezed out of the plexus of veins which composes it there is very little tissue left. Thus anything which occludes or destroys

the blood vessels shrinks the hemorrhoid to almost nothing. Only a little ridge of scar tissue is left. This method of cure can be used only in the case of internal hemorrhoids. The cure can be produced by two non-operative procedures, which I will briefly outline.

The first is electrolysis. The direct current is employed. A dispersive pad is placed on the abdomen and then one or more needles connected with the opposite pole inserted into the hemorrhoid. Either the positive or negative pole may be used. From three to fifteen milliamperes of current is allowed to flow from five to thirty minutes. The pile turns a gray white color, at which point treatment is discontinued. One or two treatments suffice to cure each hemorrhoid. I have used this method in a number of cases but have practically discarded it for the injection method. My reason for this is that the injection method is much more rapid and in my experience has been less disagreeable to the patient.

Of the injection method there are two variations. The first I speak of only to condemn. That is the injection of strong solutions (usually carbolic acid) for the purpose of destroying the hemorrhoid and causing it to slough. I consider this a dangerous practice. It is the older method and the one from which most of the complications and deaths were reported. It is impossible to limit the extent of the destruction of tissue, and infection, abscess and secondary hemorrhage are complications which may occur. For these reasons I never employ it.

The other method consists of the injection of less strong solutions into the hemorrhoids. The purpose of these is to produce enough irritation so that the blood vessel is occluded by the resulting scar tissue, thus curing the hemorrhoid. I have tried various solutions and believe that it makes very little difference what solution is used, provided that it is just strong enough to produce the required reaction without producing a slough. A solution of 20 per cent carbolic acid is recommended by Morley and most of the older formulas contained this drug in from 5 to 50 per cent. To the phenol has been added fluid extract of ergot, olive oil, glycerine, witch hazel, creosote, zinc chloride, salicylic acid and many others, either alone or in combinations. These I think are entirely unnecessary, but were added to suit the whim of some individual who probably did not

know himself just what action they produced. The phenol is the active agent and is sufficient.

At the present time quinine urea hydrochloride in from 5 to 10 per cent solution is probably being used more extensively than any other solution. This was first advocated by Terrell of Richmond, Virginia, in 1913. This drug produces the desired result. It is practically non-toxic and, in my experience, less likely to cause pain than the phenol solutions. I have seen one patient who had an idiosyncrasy for quinine made quite ill by one injection and have had a few patients who complained of roaring in the ears. Otherwise, I have seen no complications caused by the drug itself. The technique of these injections is relatively simple. The internal hemorrhoid is brought into view through a slotted speculum. The surface is swabbed with alcohol and from .25 to 1 c.c. of solution injected deep into the center of the pile near its base. The number of hemorrhoids treated at one time and the interval between injections is governed by the reaction produced.

I have used this method of treatment in approximately 1,200 cases, charity and private. One patient had a severe reaction due to an idiosyncrasy to quinine. There have been several cases of superficial sloughing. This was caused by too much fluid being injected and too near the surface. In these, three were followed by secondary hemorrhage, but in each instance the patient, contrary to advice, allowed himself to become constipated. There have been no deaths and the end results have been uniformly good. From these cases and those reported by other men doing any considerable amount of rectal work, I cannot but feel that it is really less dangerous than the usual operative procedure and that the results are fully as good.

In conclusion then, what can be said concerning the non-surgical treatment?

1. It is an old method which even in the hands of incompetent men produced some good results.
2. In the past ten or fifteen years it has been adopted by the majority of men specializing in rectal diseases.
3. From reports of these men, the method in selected cases gives fully as good results as the usual operative procedure.
4. Conservatively speaking, it is at least no more dangerous than the operative procedure.
5. It does not confine the patient to bed or keep him from his ordinary occupation.
6. Many sufferers will submit to this method of treatment when they refuse operation.
7. By refusing to use this form of treatment where possible, we drive our patients into the hands of incompetent and unscrupulous quacks to the detriment of both the patients and our profession.

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THE SCIENTIFIC AMERICAN ON ABRAMS' "ELECTRONIC REACTIONS"

In October, 1923, the Scientific American announced that it was undertaking an investigation of the "Electronic Reactions of Abrams" and electronic medicines in general. The Scientific American has published twelve papers and the last has now appeared. The result of the exhaustive investigation of the committee may be summed up: The electronic reactions of Abrams and electronic medicine in general is found utterly worthless. This is expressed a

little more in detail in the opening paragraph of the last article: "The so-called Electronic Reactions of Abrams do not exist—at least objectively. They are merely products of the Abrams practitioner's mind. These so-called reactions are without diagnostic value. And the Abrams oscilloclast, intended to restore the proper electronic conditions in the diseased or ailing body, is barren of real therapeutic value. The entire Abrams technique is not worthy of serious attention in any of its numerous variations. At best, it is all an illusion. At worst, it is a colossal fraud." —(*Journal A. M. A., Sept. 20, 1924, p. 939.*)

INDICATIONS FOR SURGERY IN DUODENAL ULCER*

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The diagnosis of duodenal ulcer having been established its treatment becomes the issue. A long controversy has been waged as to the proper ways and means of management; neither the medical nor the surgical exponents have been lacking in weighty evidence for their respective fields, nor in damaging array of statistics against their opponents. From this it is obvious that while both branches have had their successes and their failures a co-operative method of studying and caring for these cases should aid both internist and surgeon, with increased benefit to the sufferers.

There are various reasons for this divergency of opinions as to the treatment, because of the very nature of the disease. From the anatomical viewpoint the lesion is hidden and consequently cannot be actually verified except by surgery. Again the condition itself is often characterized by a tendency toward cyclic manifestations; that is, periods of exacerbation and remission, thereby often lending great weight to conjectures, even though wrongly placed. Again the symptomatology of duodenal ulcer can be in part or wholly simulated by pathological changes elsewhere. This paper acknowledges the presence of errors in diagnoses in our series of duodenal ulcer in spite of a routine method of investigation consisting of an exhaustive history, physical examinations, roentgen studies, laboratory studies and numerous subsequent therapeutic checkups.

Once a diagnosis has been reached with the methods available today the immediate management of the case presents. It is our observation that relatively few are surgical at the outset, surgical in the sense that the ulcer itself or its symptoms are demanding of immediate operative intervention. This does not apply to surgical treatment of co-existing or probably better, pre-existing lesions such as infections of tonsils, teeth, sinuses, pelvis, etc. Operative treatment of these should not be classified as surgery of the ulcer per se, though their proper handling may be indispensable in the medical management of the ulcer.

Further, it has been our observation over a period of ten years during which time approximately eleven hundred cases of duodenal ulcer have been studied, that the greater portion of the ulcers demanding surgery are those who have had little or no care either in the way of removal of these co-existing infective processes or in proper medical supervision; that is, the patients who are surgical are largely those who are chronic sufferers in whom the lesion has wrought marked or permanent changes in the digestive tract.

Accordingly we have placed the majority of all cases on medical management admitting that a variable number of these will become surgical because of various factors entering into the individual case which the internist alone cannot hope to cope with. In properly selected cases it has been fairly demonstrated that a carefully planned systematic medical regime over a sufficient period of time will give the desired results in a large percentage. By results is meant that the patient shows a response to medical care, by freedom from pain and discomfort, return to satisfactory weight level, a regaining of strength so that the patient may carry on his vocation, and lastly, absence of previous ulcer symptoms. These should be attained early in the management and be maintained indefinitely.

While duodenal ulcer is classified as a clinical entity one may also consider it one of the manifestations of an infective process, the ulcer producing the greater train of symptoms. While the etiology of duodenal ulcer is as yet unsettled, we feel that the clinical evidence leans toward the theory of infection and its resultant toxemias. Because of this and because of the otherwise betterment of the general health surgery may be called upon to aid in the removal of foci of infection, these blocking the management until eradicated. That infection may play a most important role is further evidenced by the periodicity of the exacerbation—a plausible explanation being the variance of resistance versus virulence.

The cases to be surgically treated will be those for whom such management was not deemed advisable at the time first seen and those who failed to obtain relief under careful medical direction. These cases will be found to align themselves into several main groups, namely:

1. Those suffering from obstruction to the food current, due to stenosis, cicatrices, adhesions, etc.
2. Those with, or attempting, perforation.

*Read before the Northern Minnesota Medical Association, Duluth, August, 1924.

3. Those with associated intra-abdominal lesions.
4. Those with repeated hemorrhages.
5. Those where a question of malignancy enters into consideration.
6. Those suffering repeated exacerbations despite thorough and complete medical management.
7. Those who for various reasons cannot or will not submit to a medical regime over a sufficient period of time.

A patient's working conditions or his economic status cannot in themselves be classed as reasons for considering surgery prior to a carefully planned management, although the patient's inability to co-operate may decide and offer but one solution, namely, operative intervention. Neither is a recurrence of previous ulcer symptomatology necessarily proof of medical inability to control the condition. It is not the number of breakdowns that alone determine for surgery, but the degree of intensity with which the patient and physician have carried on.

The marked tendency toward chronicity in duodenal ulcer in itself may be but a further manifestation of hidden or unlocated causative forces which if recognized and removed would ultimately favor a complete recovery. The pathologists inform us that healed ulcers of the duodenum are often seen. That nature needs but little aid—but this often and prolonged—is well shown by the immediate improvement seen in a majority of these cases as soon as management is instituted. Cases that do not show immediate response should be looked upon with suspicion as to the reliability of the diagnosis. If further studies reveal the presence of ulcer it is well to consider the possibility of associated lesions entering the picture.

The point so often heard that duodenal ulcer patients break down eventually regardless of medical efforts is, we believe, of no great argumentative value. Granted that a number do relapse, this point is no more applicable to duodenal ulcer than to many other clinical entities in which the relief of a train of symptoms is not necessarily proof of their inability to recur.

The consideration of these cases then who for various reasons do not respond medically should constitute the surgical aspect of duodenal ulcer. Surgery, while of undeniable benefit, and in fact the only salvation in some types of ulcer, should

be much as a court of last appeal, or better, as an adjunct to methods previously applied.

No mention has been made of those cases of duodenal ulcer in whom other pathological processes have developed to advanced stages, as for instance, duodenal ulcer complicated by diabetes, nephritis, marked cardiac or vascular disease, etc. The handling of these cases will of necessity depend upon the picture as presented by the individual patient.

The detailed technical phases of the various operative procedures will not be gone into at this time, however, a consideration of the pre- and post-operative periods are worthy of both the internist's and surgeon's attention. Too great emphasis cannot be placed on the preoperative preparation of these people. Especially is this true of the chronic sufferer who has had increasing obstruction with corresponding lowering of general health and often in addition concomitant lesions in other vital tissues. When first seen they are often markedly dehydrated, toxic, malnourished and in no way capable of withstanding the additional taxation involved by surgical intervention. Here is probably the greatest opportunity for actual co-operation of internist and surgeon. It is remarkable how responsive these otherwise poor surgical risks are to preoperative preparation consisting essentially of alleviation of pain and discomfort, absolute rest, re-establishment of balance of body fluids, etc., to the extent that in a short time one can feel safe in assuming their resistance has more nearly approached the normal, thereby lessening the operative hazards.

The question of the choice of anesthesia, while always one of great moment, is of special import in many of these subjects. In suitable cases, local anesthesia offers much to the patient's ultimate benefit; in fact, it may be the only method by which the necessary surgery can be safely attempted.

In considering the numerous types of operative procedure for relief of duodenal ulcer it will be found that all methods can be grouped under two main headings, namely:

1. Those in which the removal of the diseased area is the essential.
 2. Those in which increased gastric drainage or shunting of the food current is the primary object.
- From these two basic principles numerous modifications and combinations have evolved. It is

necessarily so in view of the manifold variations in the character of the lesion, as to size, location, extent of involvement of adjacent tissues, associated pathology in other organs, etc.

It is at once apparent that no one procedure will be applicable to all cases, the selection of the time and method of repair determining to a large extent one's successes.

The importance of the preoperative period has been briefly outlined. The operation passed, the postoperative care presents. This should be immediately instituted, the internist insisting on the same detailed supervision and this over a period of time comparable with that of an ulcer medically treated.

The purpose of medical education is to provide for the present and future citizens of the country the best medical care, service, and attention that is possible under the circumstances. We are not doing this today. And we are not likely to do this until we realize the faults in our present system of medical education.

Just now the story is making the rounds that there is a shortage of medical men. Nothing could be further from the truth. The fact is that the medical profession as a whole, and particularly of the cities, is greatly overcrowded. Seventy-five per cent of the medical men of Chicago could easily do twice as much work as they are actually doing, and should do twice as much and have twice their present incomes, if they are to get a fair return on the money invested in their education. The real difficulty is a faulty distribution as to location and the prevailing tendency of medical schools to turn out more and more specialists and fewer and fewer general practitioners. As a consequence of the above, the residents of some of our rural districts are in danger of soon not getting the kind of medical service which their ordinary ills require, for fully ninety per cent of human ills can be best treated by a well-trained general practitioner. My contention is that the medical schools of today, particularly the ultra-scientific medical schools, do not properly supply the demands of the times and that the education offered and the text-books used are extremely faulty. The medical schools must first realize their shortcomings, then deliberately make an effort to fulfill the function for which they are primarily created, namely, the education of general practitioners of medicine. The education of the specialists should be left to properly constituted post-graduate medical schools and hospitals. Every medical student should first of all be given the opportunity to become an efficient general practitioner, and then later, after having had five years or more of experience in the general practice of medicine, if he shows special fitness and a desire to become a specialist, the post-graduate schools and hospitals should offer the opportunity.—*E. H. Ochsner, M.D., Illinois Med. Jour., June, 1924.*

THE CHOICE OF METHOD IN BLOOD TRANSFUSION*

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Blood has, since time immemorial, aroused the interest of mankind. Certain savages believe, to this day, that by drinking the blood of a particularly courageous enemy they will be endowed with his virtues.

The idea of the intravascular introduction of the blood of another, while representing a much higher mental development, is still centuries old and antedates Harvey's discovery of the circulation. The first recorded attempt is probably that of the Jewish physician in attendance upon the last illness of Pope Innocent VIII in 1492.¹ He employed three small boys as donors, all of whom died and without benefit to the patient.

Transfusion between animals was actually accomplished in 1665.²

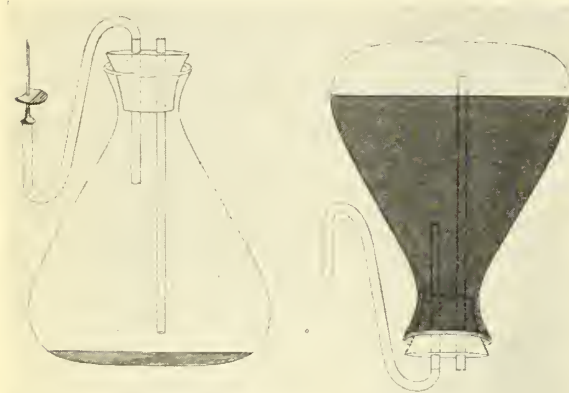
Little of a really constructive nature was done in this line for several centuries. With the stimulus to surgical progress offered by the work of Pasteur and Lister the subject again came into prominence and many were the methods employed when intravenous injection was found to be feasible. At this time premature clotting of the blood offered one of the greatest obstacles to the successful completion of the procedure. To avoid this it became popular to use defibrinated blood for injection. The excess of fibrin ferment present rendered the blood highly toxic in itself and when it is remembered that at that time blood groups were not dreamed of, we may well imagine that when disaster did not follow, results were at best indifferent. It must also be recalled that at this time the indications for transfusion were as vague as the technique was uncertain and it was advocated as a cure for any and every condition from simple anemia to senescence.

It has remained for the present century to see blood transfusion changed from a dream to a practical procedure of recognized clinical value and a few well recognized indications have supplanted the innumerable uses of an earlier day.

The entire feasibility of the procedure was first demonstrated through the advances in blood-vessel

*Read before the Ramsey County Medical Society, St. Paul, March 31, 1924.

surgery made by Murphy, Crile and Carrel, who were able to join the artery of one person to the vein of another so as to permit the unobstructed flow of blood from donor to recipient. The last link in the chain of safety was forged by Moss³ and Jansky, whose work on blood grouping placed the human race in four groups dependent upon serologic interaction between blood and corpuscles.



Flask prepared for transfusion by the citrate method

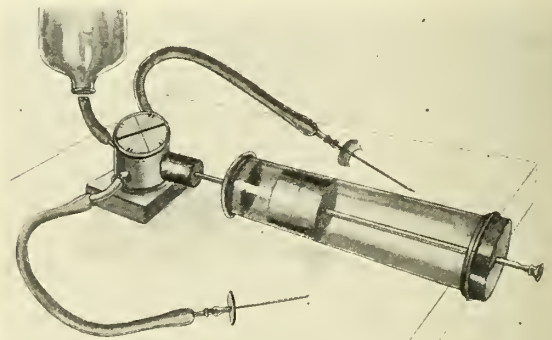
Fig. 1. Flask arranged for citrate transfusion. This contains 2 grams of sodium citrate dissolved in 50 c.c. of water. When mixed with 500 c.c. of blood the concentration is 0.36 per cent. The cork is loose on withdrawing blood. A pressure bulb is attached to the longer piece of glass tubing and used to force the blood into the recipient.

These studies showed the reason for the severe and sometimes fatal reactions which had occurred with such painful frequency in the early days of transfusion and pointed the way to safety.

Transfusion by blood-vessel suture left but one thing to be desired, namely, the ability to estimate accurately the amount of blood which passed over. This is a thing which is of great importance and impossible of performance unless the blood is taken momentarily into some measuring device before reinjection into the patient. Present-day methods have been devised primarily to overcome this difficulty and it is with them that this paper deals. They may be included under three general heads and while many modifications of unimportant details exist at different clinics, the list is increased only by sub-groups. Singularly enough, the three methods were reported in three successive years and one depending upon chemical alteration of the blood to prevent coagulation while the other two deal with unmodified blood.

The first of these is the so-called citrate method of Lewisohn,⁴ who made use of the fact that blood containing a small concentration of sodium citrate,

usually 0.2—0.25 per cent, does not clot. So far as the original purpose, namely, the maintenance of a fluid state in the blood, is concerned, the citrate method is above reproach, as it may stand for hours or even days without clotting. At this point, however, the desirability of the method ceases, as later investigations have shown that in it, clinical value is sacrificed to convenience. After the method first came into use, reports came from all sides of so-called "reactions" which appeared within the following twenty-four hours. These consisted of a rise of temperature, with or without a chill, and evidence of hemolysis such as hemoglobinuria and a transient yellowish pigmentation of the skin and sclerae. The more severe reactions may lead to severe muscular pains, dyspnea and even death, while the milder grades have but a few hours of discomfort. These reactions occur between individuals with perfectly matched and grouped bloods and the secret evidently lies in the fact that such a complex and delicate physiologic product as blood is altered not only in its physical state but also in its biologic properties by the chemical treatment. Among users of the citrate method reports vary from 25 per cent to as high as 60 per cent of reactions. In a few instances



UNGER APPARATUS FOR WHOLE BLOOD TRANSFUSION

Fig. 2

such easily remedied accessories as new tubing and stale distilled water have been blamed for the reactions, but the fact remains that they are not eliminated when freshly distilled water and thoroughly seasoned tubing have been employed.

Unger⁵ has undertaken by a rather elaborate series of experiments to compare the qualities of citrated blood and the blood of animals and persons who have been treated with citrate transfusion

with whole unaltered blood. He has made some very significant observations which should be carefully weighed in the choice of a method for transfusion. He finds:

1. The addition of sodium citrate to the blood causes an increased fragility of the red blood cells. This tends to make the results of the transfusion short lived and shortens the usefulness of the transfused cells as oxygen carrier. Where the tendency already exists as in pernicious anemia it cannot but be inferior to one of the methods employing unaltered blood.



Fig. 3

2. It destroys the complement of the blood, as it also destroys the opsonins, thus rendering the method of inferior value where it is desired to combat sepsis or fortify the resistance of the individual to infection.
3. Phagocytosis is inhibited, which again reduces the value in the treatment of infection.

The work of Neuhof and Hirshfeld⁶ shows that citrate transfusions may have some place in the treatment of hemorrhage. These workers found that the injection of sodium citrate alone, either intravenously or intramuscularly, into a patient resulted in a marked reduction in clotting time. This phenomenon is more noticeable as the amount injected increases up to the point of toxicity, where there is a reversal of the process and the blood becomes incoagulable. They found that a clotting

time of ten minutes might be reduced to approximately two minutes by such measures. This procedure proved to be of value in all pathologic increases of the clotting time with the exception of those diseases characterized by a deficiency of blood platelets such as hemophilia and purpura. Good results were obtained in jaundice. With citrated blood a stage of toxification has been reached so that it does not clot. However, when it has been diluted by the entire mass of blood in the circulatory system the concentration is reduced to that point where the coagulation time is shortened.

To give an impartial verdict on the citrate method: It is easily and simply carried out, undoubtedly has value where transfusion is indicated, but has certain biologic after-effects which render it distinctly inferior to either of the whole-blood methods.

The methods employed in transfusion of unaltered blood rely upon rapidity and gentleness of manipulation with intermediate containers whose surfaces have been coated with non-irritating compounds to delay the inception of coagulation.

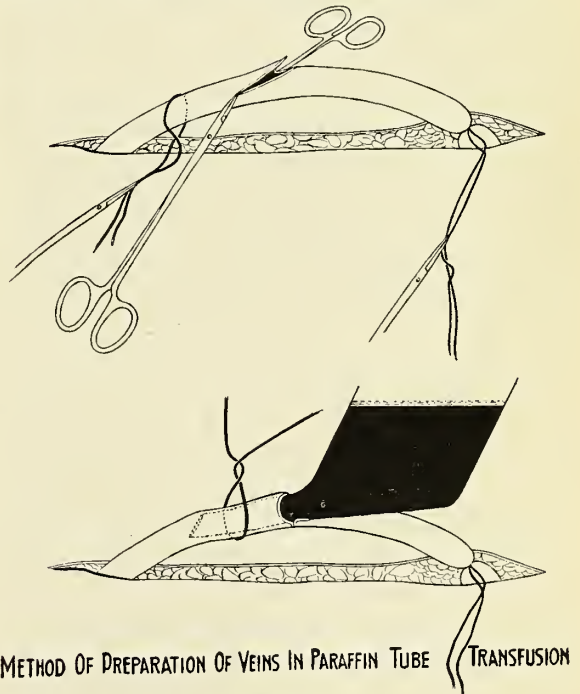


Fig. 4

The first of these is the so-called paraffin tube method which was brought out by Kimpton and Brown in 1913. They use a large glass container which has a small opening, closing with a cork at

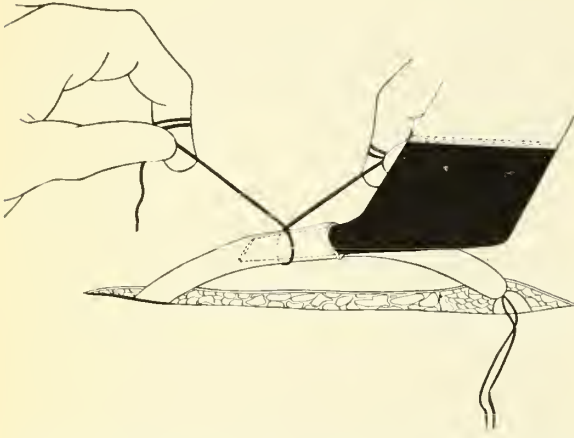
the top, a side arm and a rather tortuous outlet at the lower end. This is coated on the inside with melted paraffin, which is allowed to cool, preventing mechanical irritation of the contained blood. The tube since devised by Vincent has a straighter, more easily cleaned outlet, and probably makes for greater efficiency. In carrying out a transfusion by this method, a few cubic centimeters of

by means of a cautery bulb attached to the side-arm. As the last of the blood leaves the tube it must be rapidly withdrawn from the vein and the vein closed, otherwise serious air embolism might result. When 600 to 900 c.c. have been transferred, by the use of two or three tubes, the transfusion is complete and the veins may be ligated and the skin closed.

Objections to the paraffin tube method have been based on several grounds which may be worthy of discussion:

1. Certain writers have objected to the fact that a skin incision is necessary as smacking too much of a surgical operation. The small skin incision necessary is scarcely to be dignified by that name and where the method is employed as a preoperative and postoperative measure at the time of more formidable surgical measures, it is probably the most rapid and efficient means of transfusion.
2. It has been objected that the ligation of one of the veins of the forearm is wrong when other methods might obviate that necessity. Again a small matter, in the author's opinion, for the average surgical transfusion, which seldom occurs to a person more than once in a lifetime. The superficial veins of the forearm are sufficiently numerous that the loss of one of them need cause no concern. With medical cases such as pernicious anemia, where repeated transfusions are needed, it is a different matter and will be mentioned later.
3. It has been claimed that proper paraffin coating of the tubes is extremely difficult. In the author's experience it is quite simple to secure a complete and smooth coating if both tube and paraffin are well heated. The one point where the greatest care is necessary is to prevent collection and cooling of small droplets in the outlet or sidearm, as either necessitates that the tube be recoated.

The last method to be described is that of Unger, who has devised a mechanical contrivance for securing the desired result. This consists of a small round box-like affair with four outlets to each of which is attached a piece of rubber tubing. Two of these on opposite sides have needles entering the vein of the donor and the recipient, the



METHOD OF TYING OUTLET POINT INTO VEIN TO PREVENT LEAKAGE

Fig. 5

novocaine solution are injected under the skin overlying one of the veins of the forearm and a short incision made. The vein is freed and two strands of suture material passed about it, one proximally and one distally. In the donor the vein is tied off proximally and in the recipient, distally. The other legature is not tied until the transfusion is completed, but the ends are grasped by a hemostat, which is left attached. Traction on this ligature serves to stop all outflow of blood. A three-cornered incision is made in the donor's vein and the outlet of the tube inserted, point directed distally. A blood-pressure cuff about the upper arm is inflated to 50 mm. of mercury and held at this point until the tube is filled. Filling proceeds rapidly and can be aided by rhythmic contraction and relaxation of the muscles of the donor's forearm. This simulates the action of a pump. When filling is completed, the sidearm is covered by the thumb of the hand holding the tube and it is carried to the recipient, whose vein is similarly prepared, an assistant meanwhile making traction on the untied ligature about the donor's vein to prevent bleeding. The outlet of the tube is inserted into the recipient's vein, point directed proximally. The blood can rapidly be pumped into the vein

third is connected to a 50 c.c. syringe, which is well lubricated with paraffin oil, and the fourth is attached to a graduated funnel of saline. The cover fills the box, is grooved on opposite sides and rotates through ninety degrees. When the transfusion is started the cover is turned to the point where the syringe can be filled from the donor's vein while saline runs slowly into the recipient, keeping the needle and tubing free from blood, so that no clotting may obstruct the lumen. When the syringe is filled the cover is rotated to the point where the blood can be forced out, this time into the recipient, while the saline flows into the donor and keeps the needle and the tubing clean. When the syringe is empty the cover is reversed and more blood drawn. This procedure is repeated a sufficient number of times to transfer the desired quantity of blood.

The Unger method is a highly practical means of transfusion and gives excellent results where repeated transfusions are necessary, as the same vein may be used time and again. The weak points of the method are several and should be mentioned. First, the method is slower than the paraffin tube method and where speed is a factor in single transfusions it must be discarded. Second, there is a greater risk of clot formation in the relatively intricate mechanism than in either of the other methods. Third, the successful completion of a transfusion requires that two needles be kept in two separate veins and in working condition at the same time, sometimes a difficult matter with a single needle and vein where the patient is apprehensive and restless, or where the veins are small and difficult to find.

As contrasted with the citrate method, the whole blood methods offer certain quite definite advantages insofar as the results obtained are concerned. Post-transfusional reactions have been mentioned as one of the serious drawbacks of the citrate method, while following either of the whole blood methods they are a rarity. In an experience of some 250 paraffin tube transfusions and perhaps twenty by the Unger method, the author does not recall a single instance of transfusion between patients with compatible bloods where any after-effect which could be dignified by the name of reaction has been noted. Rarely, if ever, does the temperature rise above 100 degrees as a result. All writers report a low percentage of reactions, some less than one per cent.

This must not be taken to mean that the after-effects will be negligible if a donor of the wrong group is used, for under such circumstances the response will be swift and unmistakable. In the few instances which it has been the author's ill-fortune to witness, the patient has been trembling, dyspneic and complaining of precordial pain by the time 150 c.c. of blood had been received. If the transfusion is immediately stopped on the appearance of such symptoms no greater harm results than an unsuccessful transfusion and a case of hemolytic jaundice, but if the warning is disregarded death may result.

When sepsis is the indication to be met, the method employed should be one of those employing the unmodified blood, as by this means immune bodies may be transferred intact and unaltered by the paralyzing effect of the sodium citrate. Similarly in the anemias, particularly of the primary variety, the use of sodium citrate increases the fragility and shortens the lives of the already too friable red cells and it should be discarded for a method with fewer drawbacks. In the acute anemia of hemorrhage, where a shortening of the clotting time is desired, the use of citrate transfusion seems most justifiable, but objections may be offered to its use in even this limited field, since striking results follow the giving of whole blood.

Recent studies have demonstrated that infants may be transfused by the injection of blood into the peritoneal cavity, whence it is absorbed into the circulatory system, but the author must plead lack of experience in this procedure and omit it from discussion.

CONCLUSIONS

1. The sodium citrate method carries with it heavy liabilities and should be discarded insofar as possible.
2. Transfusion as an aid to surgical measures where more than one transfusion is rarely necessary can best be done by the paraffin tube method.
3. In conditions requiring repeated transfusions, namely, the anemias and other medical conditions, the Unger method is preferable to all others.

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"The type of practice of a decade ago permitted much symptomatic treatment. Diseases were allowed to run their course. The doctor was in a way the protector and nurse and comforter of the patient. The marked advances made in preventive medicine make it inevitable that the medical student of today and tomorrow must study the normal more than the abnormal and that he must be familiar with the incipient stages of all disease processes and recognize the first perversions from normal physiology and the first signs of abnormal pathology. The old easy practice of medicine has gone never to return. Great skill in the recognition of the early stages of disease means pre-eminence in medicine in the future. It is unfortunate that these periods of the beginning of disease are most susceptible to quackery and to deceit. We are all familiar with the phrase "threatened with pneumonia" or "threatened with disease." It is also inevitable that the very fact that we are able to relieve patients in the early stages of their diseases will in a way interfere with their interpretation of our success.

"The man who has an early operation for appendicitis often has such an easy time following his operation and during his convalescence that he sometimes wonders whether the operation was necessary. There is still great respect for the doctor who lets the patient go so far that he is only able to save him by the most energetic and persistent attention. This need not interfere with sound medicine and an increase in the respect on the part of the public for medicine. There is a gradually rising level of intelligence among our people and more and more of them are getting some biological understanding of life."—Extract from address by Dr. Ray Lyman Wilbur, President-elect of the A. M. A., at annual meeting of the California State Medical Society, May 16, 1922.

POST-OPERATIVE MANAGEMENT FOLLOWING GASTRIC OPERATIONS *

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Until recent years operations upon the stomach for ulcer of the stomach and duodenum and for gastric carcinoma have not received the attention they merit from the standpoint of postoperative treatment. The early recognition of the different types of complications and the institution of prompt and efficient treatment may mean not only the saving of a life, but may have a very definite bearing upon the success of the operation from the standpoint of a cure. In normal post-operative reactions the proper dietary treatment may prevent serious post-operative complications and is also a very important factor, from the standpoint of the ultimate success of the operation, in procuring permanent relief of the condition.

Operations upon the stomach naturally fall into two divisions from the standpoint of post-operative complications.

1. Gastro-enterostomies for duodenal or gastric ulcer where no further surgery on the stomach is done. Knife excision of duodenal ulcer with minor type of pyloroplasty such as a Mikulicz.

2. Gastric resections including Billroth No. I, Billroth No. II, anterior Polya, posterior Polya, and sleeve resection as well as Finney type pyloroplasties and gastro-enterostomies where a knife or cautery excision of a gastric ulcer is performed.

Complications following the first group, which comprises chiefly gastro-enterostomies, may be divided roughly into early and late complications.

Among the early complications hemorrhage⁶ is probably the most important. Evidence² of hemorrhage may be seen at any time within the first forty-eight hours. The vomiting of bright red blood in any appreciable amounts should be considered very seriously. Vomiting of small amounts within a few hours of the operation does not mean much as it is usually due to residual blood left in the stomach following the operation or to a very slow oozing along the suture line. Clotting usual-

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ly takes place within a short time in these cases. The onset of a real hemorrhage is usually the result of suddenly increased arterial or venous pressure due to straining from vomiting or coughing. In these cases the stomach is unable to empty through the pylorus and gastro-enterostomy opening as fast as it fills with blood, with the result that a reflex vomiting is set up. Vomiting attacks may occur regularly from a few minutes to an hour apart. The blood is usually bright red and may be accompanied by large clots. Morphine hypodermically in doses large enough to produce absolute quiet is indicated. Ice bags should be put to the epigastrium. Repeated gastric lavage with water at a temperature of 120 F. will usually control the bleeding. This may be performed as early as twelve hours post-operative without danger. In case the bleeding has been extensive enough to materially reduce the blood volume, hypodermoclysis of normal saline, intravenous saline injections, and blood transfusions are indicated. The use of the various intravenous medications for the purpose of decreasing the coagulation time of the blood and promoting clot formation may be useful and should be tried along with other methods.

Profound operative and post-operative surgical shock following operations upon the stomach is of infrequent occurrence in the hands of experienced surgeons. It is usually due to prolonged operation with marked surgical trauma and is more frequent in its occurrence in the debilitated and dehydrated type of case seen so often with gastric carcinoma. Its occurrence following simple gastro-enterostomy is very rare. In cases with marked obstruction at the outlet due to contracture from scar tissue formation and its resultant dehydration and debilitation the incidence may be more frequent. However, it must be remembered that post-operative surgical shock and other complications can be practically eliminated by proper pre-operative measures in preparing the patient. When surgical shock occurs it is usually present directly after operation. It may be mild and transient or it may present more marked and serious symptoms. The symptoms are identical with surgical shock seen in other conditions. The patient presents the typical picture of a rapid, feeble pulse, slow, shallow respirations, marked perspiration, and a cold clammy feeling of the skin which is of a dead, whitish color. The milder cases usually respond very readily to the ordinary measures, such as ele-

vation of the foot of the bed, external heat to the body in the form of numerous hot water bags, and the administration of a shock enema containing black coffee and whiskey. If the patient does not respond to this treatment within an hour the condition should be considered more serious. Transfusion, and intravenous and subcutaneous saline are indicated if there has been any appreciable bleeding. An immediate transfusion of 500 c.c. of blood will often be found to tide a patient over this very critical point, when all other measures may fail. This is indicated whether or not there has been any extensive loss of blood. Caffeine hypodermically as a stimulant is also useful.

Brown⁴ advocates feeding the patient peptonized milk while on the operating table as a preventative of surgical shock. He inserts a soft rubber catheter into the stomach just before it is entirely closed, passes it down into the lower jejunum; introduces the peptonized milk; withdraws the catheter and completes the operation.

Dilatation⁷ of the stomach occurs occasionally following gastric operations. Of ninety-two post-operative cases reported by Borchgrevink,³ six occurred after stomach operations, while thirty followed operations on the female genital organs. The most common time of onset is within the first forty-eight hours post-operative. Reardan¹¹ reports two cases of dilatation during the time of operation and emphasizes this phase of the subject.

There have been many theories⁹ as to the cause of this condition of which two are the most important. First, the theory of duodenal occlusion produced by the upper border of the mesentery with its contained superior mesenteric vessels. Second, that of a paralysis of the muscular wall of the stomach, possibly due to swelling and edema around the site of the operation. This results in temporary obstruction to the extent that anti-peristalsis is not sufficient to cause it to empty itself. The latter theory at the present time is the most commonly accepted explanation of acute post-operative gastric dilatation. Because the patient is not getting fluids in any form by mouth is not sufficient reason for neglecting to consider the possibility of dilated stomach as the cause of the trouble if the patient is not doing well. Oozing around the site of the operation and the normal secretion of the mucous membrane is sufficient to cause this condition if the stomach is not emptying itself properly.

Vomiting is usually a prominent symptom, and is an overflow, regurgitant type, large quantities of bile stained material being expelled. Pain varies from a mild discomfort to severe epigastric distress. If the condition exists for any period of time, the patient will often show signs of collapse, with a rapid thready pulse, the skin cold and moist and respirations rapid and shallow. Due to the loss of large amounts of fluid by vomiting, there is an extreme thirst and a scanty excretion of urine. Examination of the abdomen with the dressing off will usually reveal the trouble. Dullness over the stomach area with distention especially of the left abdomen should be sufficient reason for the use of the stomach tube. The above symptoms, with the escape of a large quantity of fluid and gas, and the relief of the distention on passage of the stomach tube, will establish the diagnosis.

The treatment consists first, of early and efficient gastric lavage, and second of postural treatment. Lavage should be performed on the first suggestion of any of the above symptoms, and repeated every six hours or frequently enough to keep the stomach empty. The statement attributed to a famous surgeon, that a young man entering the practice of surgery should discard his stethoscope and replace it with a stomach tube about his neck, while not to be taken literally, nevertheless serves to emphasize its importance in general surgery. The value of its proper use is even more marked as applied to gastric surgery. Oschner¹⁰ now has a standing order for his patients that "the moment a patient vomits or is nauseated or complains of gas pressure, gastric lavage with water at a temperature of 105 F. is performed immediately." In a considerable experience in gastric surgery the authors have never seen harmful results from the use of the stomach tube. Schwartz¹² reports one case of perforation of a chronic gastric ulcer caused by trauma from a stomach tube, but such cases are so rare that they can be disregarded when we consider the great benefit derived from the proper use of this simple instrument.

Secondly, if possible the patient should be placed in the knee-chest position, with the hips elevated higher than the head. Theoretically this will relieve the pressure from the intestines and mesentery on the duodenum.

No operative treatment for gastric dilatation has been found to be successful.

Some form of gastric obstruction is probably the

most frequent and important complication of gastric surgery. It may be temporary or permanent, mechanical or inflammatory, partial or complete.

The causes are incorrect diet, inflammatory swelling and edema around the stoma, mechanical twists or kinks in the loops, too small an opening, constriction due to scar tissue, misplacement of a gastro-enterostomy, peritonitic ileus and anterior gastro-enterostomy. It should be understood that the latter is only done in cases of carcinoma, with complete or almost complete obstruction, as a purely palliative measure, where it is impossible to do a posterior gastro-enterostomy. The importance of a proper dietary regime as a prophylactic measure against obstruction cannot be too strongly emphasized. This will be discussed in more detail later.

The first symptoms of obstruction may be noticed any time after the first twenty-four hours. The most frequent time of onset, however, is from the seventh to the twelfth day post-operative. The patient frequently will not complain, but on close questioning will admit that he does not feel as well as on the previous day, or "that he has a full feeling" after eating. Very often hiccough will be the first symptom of gastric retention. We have never seen a patient with hiccough after a gastric operation fail to reveal retention.

If these milder and apparently insignificant signs are not noted or regarded as sufficient evidence for the use of the stomach tube, the unmistakable sign of vomiting will soon ensue, and unless prompt and efficient treatment is instituted, the patient will lose ground rapidly.

The treatment should be directed along two lines, dietary and lavage. First, gastric lavage should be done at least twice a day. If this does not keep the stomach empty, or there is retention of over 500 c.c., it should be performed every six hours. Secondly, everything should be taken away by mouth for twenty-four hours, and a fluid intake of 2,000 to 3,000 c.c. a day maintained by proctoclysis of tap water, or 2 per cent soda bicarbonate and 5 per cent glucose solutions. If proctoclysis is not retained, normal saline may be given by hypodermoclysis. After twenty-four hours of starvation, fluids may be started, using tepid water, one ounce an hour by mouth for twelve hours. If retained well, small amounts of tea, broth, and gruel may be added gradually increasing until a regular post-operative retention diet is retained. During this

period it is very important to keep a careful record of the amount of fluid which is getting past the obstructed point in the bowel. The amount of material vomited and the amount withdrawn by stomach tube should be measured and subtracted from the total fluid intake. The difference should be supplemented by sufficient fluids per rectum or subcutaneously to bring the fluids up to the required amount. The retention diet should be entirely liquid with a high percentage of absorbable foods of a high caloric value, and should be given in small amounts at frequent intervals. The following is an example of the type of diet which may be used in these cases:

- 6 A. M. 1 glass hot milk (one-half cream).
- 8 A. M. Cereal gruel (made with milk) sugar.
- 10 A. M. 1 glass malted milk (one-half cream).
- 12 noon 6 oz. cream soup (one-half cream and one-half milk used).
Cocoa or Kaffee hag—cream—sugar; soft custard or jello with whipped cream; sherbet.
- 2 P. M. 1 glass buttermilk.
- 4 P. M. Egg-nog (one-half cream).
- 6 P. M. Cereal gruel—sugar, cocoa or Kaffee hag—cream and sugar, ice cream.
- 8 P. M. 1 glass hot milk (one-half cream).

This will total approximately 2,796 calories, when cocoa is served for one meal and Kaffee hag for two.

Dixon⁵ has recently shown that these cases of upper intestinal obstruction have not only characteristic clinical signs, but also constant chemical changes in the blood. These consist of a lowering of the plasma chlorides and increase of the blood urea and carbon dioxide combining power of the blood. The administration of sodium chloride subcutaneously, intravenously or by proctoclysis brings the blood findings to normal, reduces the associated toxemia and lowers the risk of a secondary operation.

A great majority of obstructive cases will be relieved by the above regime if it is persisted in. This type is usually due to an inflammatory thickening of the stoma, or to too rapid an increase in the diet, putting large quantities of food in a stomach whose innervation and normal peristalsis have been interfered with, and whose emptying power as a result is temporarily disabled.

A few cases do not respond to lavage and dietary restrictions, and these present a most serious problem. Whether to perform a secondary operation, and if so, when, and how much to do are questions of vital importance. At this stage, a patient has

been partially or totally obstructed from five to fourteen days or more. He has lost weight and strength; he is undernourished and dehydrated. The blood chlorides are low, and the carbon dioxide high. Here no general rules obtain. Each patient is a law unto himself according to the judgment and experience of the individual surgeon. One statement, however, will apply to all cases; namely, do not do too much surgery. More than one patient has lost his life because of too much surgery at this critical period.

If the condition of the patient will warrant it, the abdomen may be opened under local anesthesia, and the site of the previous operation examined for the cause of the obstruction. As previously stated this may be found to be due to too small a stoma, malposition of a gastro-enterostomy; constriction of the opening due to edema or scar tissue; mechanical twists or kinks in the proximal or distal loop, or too long a proximal loop. The relief of these conditions will again depend upon the ingenuity of the surgeon. In many malfunctioning gastro-enterostomies, a simple entero-anastomosis between the proximal and distal loop will relieve the symptoms; or an attempt may be made to enlarge the stoma. In a few cases¹ the gastro-enterostomy will have to be taken down and some form of gastro-duodenostomy performed.

The condition of many of these obstructive cases, however, will not warrant the trauma and shock incident to exploring the site of the previous operation. They are starved and dehydrated. In such a case, a jejunostomy of the C. H. Mayo type done under local anesthesia and without exploring is indeed a life saving procedure. Twelve hours after such an operation, small amounts of liquid nourishment (one ounce an hour) may be given through the enterostomy tube, this may be gradually increased until the patient is in condition to stand more extensive operative procedures, or until the obstruction is relieved.

Post-operative gastric tetany does not occur frequently. Its occurrence is always associated with gastric obstruction as described above, and is definitely dependent upon the duration and degree of obstruction. If obstructive symptoms are present, recognized early, and properly treated gastric tetany will not occur. However, in some cases the symptoms will not be sufficient to cause apprehension and the danger signals disregarded until the tetany develops. The symptoms are characteristic,

the attacks usually being preceded by drowsiness. The pulse is weak and the respirations shallow. Convulsions occur in the majority of cases and are characterized by clonic muscular contractions. They are usually followed by a comatose or semi-comatose condition. The position d'accouchiere of the hands with the thumbs slightly turned in is practically always found. The blood findings of low plasma chlorides and high carbon dioxide combining power will verify the diagnosis. Treatment consists in first relieving the attack. This may be done best by the simple administration of sodium chloride in sufficient quantities to bring the blood chlorides to normal. It may be given either subcutaneously, intravenously or by rectum or by some combination of the three. This treatment will afford complete and almost immediate relief. Further therapy should then be directed against the obstruction as described above, always bearing in mind the necessity of keeping the chlorides as near normal as possible to prevent recurrence of the tetany.

Peritonitis following gastric operations may be divided into two groups from the causative standpoint:

1. Peritonitis with no apparent contamination at operation and no evidence of leakage or perforation of the suture line.

2. Peritonitis due to leakage of the suture line. In most cases it is difficult to differentiate between the two. However, a patient who has had a normal convalescence, that suddenly develops a sharp piercing pain in the epigastrium with symptoms of shock can be definitely classed as due to sudden leakage through the line of suture.

The authors have seen two cases, in which a Murphy button entero-anastomosis between the two loops of a gastro-enterostomy was performed, develop a sudden pain in the lower abdomen and go into shock. Autopsy revealed a "blowing out" of the Murphy button anastomosis with general peritonitis. These occurred on the ninth and tenth days post-operative following an apparently normal convalescence.

If the onset of the symptoms is gradual and within a few days after operation it may or may not be due to leakage. If the symptoms are definite enough to make the diagnosis of perforation of the suture line fairly sure, operative interference is the treatment of choice. If operation is not resorted to, medical treatment with heavy doses of

morphine, ice bags to abdomen in the early stages, nothing by mouth and hypodermoclysis seems to produce as good or better results than any other treatment. At best the mortality will naturally be very high in these cases.

Even more important than the treatment of complications is the treatment of the much larger group of uncomplicated cases. This treatment should be directed toward keeping the fluid intake at a normal level and proper dietary measures. Strict adherence⁸ to a definite conservative post-operative regime will cause a much greater percentage of cases to be classed as uneventful convalescents. In the first group nothing should be given by mouth the first forty-eight hours. Proctoclysis of tap water, glucose and sodium bicarbonate, or normal saline. Hypodermoclysis may be used if proctoclysis is not well tolerated. The fluid intake should be maintained at approximately 2,000 to 2,500 c.c. per twenty-four hours. If the patient is doing well the third day he may be started on one ounce of water by mouth every hour. This should be supplemented by proctoclysis or hypodermoclysis to attain the required fluid intake. The fourth day very weak, bland, and nourishing liquids such as broth, albumen water, and tea may be substituted for the water. The fluid intake by mouth may be increased to two ounces every hour. The fifth day post-operative it is usually possible and advisable to start the patient on very soft food such as junket, oatmeal or barley jelly. This should be limited to two ounces at a feeding. If the patient is not disturbed by this and desires it, it may be given every three hours. The sixth day junket, oatmeal or barley jelly with parboiled milk containing sodium citrate may be used alternately every two to three hours. Two to four ounces at a feeding may be used if well borne; water, broth or tea in small amounts may be taken between feedings. If there is any distress from the feedings they should be discontinued and the regime of the third or fourth day used. The seventh and eighth days should be continued as the sixth, feeding every two to three hours, alternating junket with rich milk containing 15 grams of sodium bicarbonate or 1.5 ounces of lime water. Simple custard lightly cooked, oatmeal jelly, blanc mange or a fresh soft boiled egg may be used. The feedings should be about three hours apart, the quantity of food each feeding may be four to five ounces. It is important that the patient should not be disturbed

while resting. Rather forego one feeding than that the patient be aroused for this purpose.

The diet after the first week may be considerably increased but should still be very bland and non-irritating and given in relatively small, frequent feedings.

Breakfast

Four to six ounces of well cooked cream of wheat, strained oatmeal or farina, one egg, soft boiled or poached. One piece of stale bread toast or zweibach, one cup of hot water and cream.

10 A. M.

Two-thirds of a glass of rich milk with one ounce of lime water or 15 grains of sodium bicarbonate.

Lunch

Serving of cream soup, pea, bean or asparagus or puree of potato; choice of chicken or meat jelly without the meat. Small amount of baked or mashed potatoes. Sweet apple sauce or apple butter served warm. Bread and butter. Hot water and cream.

4 P. M.

Two-thirds of glass of rich milk with one ounce of lime water.

Dinner

The same as at lunch excepting no soup. Substitutes or additions such as custards, gelatine, jello and simple pudding may be made. Hot water and cream flavored with tea.

8:30 P. M.

Milk toast or hot milk with soda or lime water.

It is very important to give no meat of any kind until after the tenth day and in most cases it is best to give very little for a period of three months. A case which is otherwise doing very well may be upset and obstructive vomiting started by the use of meat. This general outline will serve very well in the majority of cases. However, each case is somewhat of a problem in itself and should be handled as such. At the slightest indication that the diet is not being well tolerated it should be stopped immediately. In some cases it may be necessary to discontinue everything by mouth for a day or two and then return to the beginning of the diet schedule and gradually work up again. Others may be simply put back a few days in the diet schedule.

Complications following the second group are similar in most respects to complications following the gastro-enterostomy group. It will be remembered that the second group includes gastric resections, Finney type pyloroplasties and gastro-enterostomies where a knife or cautery excision of a gastric ulcer is performed. The reactions following this group, as would be expected, are usually more severe, the convalescence is more protracted and the mortality definitely increased. It is un-

necessary to consider the symptoms and treatment of the various complications as this has been covered in a consideration of the first group. However, a few points of divergence are worthy of mention. Hemorrhage occurs most frequently following this group. This can be accounted for by the much larger scope of the operation with the ligation of the blood supply over a larger area. Surgical shock occurs more frequently for the same reason and because of the additional time necessary for the operation. Dilated stomach occurs less frequently in resections of the stomach. If the anastomosis is large enough and made on the dependent portion of the stomach it is practically negligible. In Finney type pyloroplasties its occurrence is more frequent though not to any marked degree. However, the convalescence following this operation is as a rule definitely protracted and long drawn out. There may be no definite post-operative complication but just a tendency not to improve as fast as following most gastric operations. This can be accounted for by the fact that the pylorus which has been enlarged is still not as large as an ordinary gastro-enterostomy. The size is materially reduced the first few days after operation by the swelling and edema practically always present until normal circulation has been re-established and healing well started. This constitutes a partial obstruction which may give signs and symptoms of obstruction, retention and tetany if not apprehended. Complete obstruction and tetany following gastric resection is very rare, one case was seen with a fatal termination. This case was an anterior polya. The patient became very ill with obstructive symptoms and died within a few hours before tetanic symptoms developed. Post mortem examination revealed intense edema of the anastomosis with gangrene of a small portion of the anterior wall of the stomach due to insufficient blood supply. Temporary partial obstruction is seen fairly frequently following gastric resections, but is practically always relieved by the prompt use of the stomach tube and dietary restrictions as previously described. Peritonitis and perforation of the suture line has a somewhat higher incidence in this group. The symptoms and treatment of these conditions may be considered essentially the same as in the gastro-enterostomy group. The possibility of a fatal outcome if complications do occur, however, is definitely increased because of the greater severity of the operation,

and greater duration of the anesthetic with consequent increased lowering of the patient's resistance.

The routine regime as established and followed in all cases in the post-operative treatment of this group consists mainly in strict adherence to a definitely restricted diet. Here again the importance of carefully following such an outline cannot be emphasized too strongly. In any considerable group of cases there will be exceptions to the general rule, however. In these cases, where the diet is not well tolerated, it should be restricted even more, occasionally to the point of giving nothing by mouth for several days. Individual judgment combined with the findings of the stomach tube are the most important factors in determining what the stomach will tolerate.

The patient should have nothing by mouth the first seventy-two hours following this group of operations. Fluid intake of 2,000 to 2,500 c.c. each day is maintained as described above. The fourth day one ounce of tepid water may be given every hour unless contra-indicated. The fifth day two ounces every hour of broth, weak tea, albumen water or grape juice may be substituted for the water. Soft food may be started on the sixth day if the patient's convalescence has been normal this far. Two ounces of junket, oatmeal jelly, buttermilk, barley water or lime water may be given every two hours. One or two feedings may be given at night if the patient awakens. The seventh day blanc mange, custard or gelatine may be added. The amount should still be limited to two ounces every hour. Two ounces of water or tea may be given on the alternate hour.

Starting on the eighth day small meals may be given. The diet from this point is essentially the same as in the first group with the difference that the whole regime is one day later.

No meat should be given until after the twelfth day post-operative. The patient should be advised to eat slowly and masticate thoroughly. Sugar and pepper should be avoided and very little salt should be used. An hour's rest lying down after each meal is advisable. Cleanliness of the teeth and a daily bowel movement should be observed.

This takes the average patient to the point where he is discharged from the hospital. Here trouble may begin if he is not cautioned especially in regard to further restriction and care in his diet. He feels good and his natural tendency is to over

eat and enjoy a good meal as a change from the hospital diet. A very safe rule to follow is to tell him to eat about the same things he was getting at the hospital at the time of his discharge and to eat them in small amounts.

When the patient is ready to be discharged from the surgeon's care it is necessary to give him definite instructions regarding what and how much he can eat. It should be explained, according to the type of operation he has had done, that his diet in general should be selected from foods that do not cause mechanical, chemical, or thermal irritation of the stomach or that his meals must be small and frequent in order to give a stomach which has been greatly reduced in size a chance to compensate.

A glass of fresh or boiled milk to which a tablespoonful of lime water has been added at 10 A. M., 4 P. M. and bedtime is advisable. After the third month it is usually possible for the patient to gradually increase his diet up to normal. If at any time he encounters trouble he should return immediately to the smaller meals at frequent intervals. Milk taken with half cream throughout the convalescent period is good practice and an excellent weight builder. Caution as to general hygiene, such as care of the mouth, daily bowel movements, daily exercise and rest after meals is advisable.

SUMMARY

Immediate recognition and treatment of post-operative complications is essential and definitely shortens the convalescent period. A post-operative regime of a restricted diet greatly lessens the chance for complications and shortens the period between the time of the operation and the time the patient considers himself completely well.

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The science and art of medicine have reached a degree of perfection so that what we need today even more than further scientific discoveries is to educate the lay public as to what medical men are actually doing for the welfare of the whole, in order that there may be better understanding and closer co-operation between the public and the medical profession. This information cannot be conveyed to the laity and this co-operation cannot be secured until the rank and file of the medical profession themselves are better informed along lines of medical economics. And we must first of all look to the medical editors of America to convey this information to the practitioners of medicine in order that they may then pass it on to the public. This gives the medical editors a wonderful opportunity to which I feel sure they will rise when they once see the importance of it. The thing to do is not to give less attention to the scientific fundamentals but to cut out many of the frills and foibles in diagnosis and treatment with which medical journals are now cluttered up. If we would pay less attention to the newer refinements in diagnosis, which often confuse rather than clarify, and to new operations which only too often complicate rather than simplify, both of which are usually discarded after a short time, and both of which I am sorry to say are only too often brought out for no better purpose than to advertise an individual physician or a group of physicians, and in place thereof devote this time to a serious study and the space thus saved to an adequate representation of problems in medical economics, we would, I believe, have smoother sailing and accomplish more good as a profession.—*E. H. Ochsner, M.D., Am. Med.*, XIX, 40, 1924.

PRE-OPERATIVE AND POST-OPERATIVE CARE OF SURGICAL PATIENTS*

A. E. SOHMER, M.D., F.A.C.S.

Mankato Clinic

Mankato, Minnesota

The care of surgical patients is interesting from several standpoints, but we wish to bring before you a few of the more interesting points of practical importance in the care of surgical patients before and after operation, not touching upon the actual operation or anesthesia of the patient.

Time of Entry Into Hospital.—Whenever possible, the patient should be in the hospital the night before operation, and in the more serious cases forty-eight hours is not too long. At this time the records can be completed, the physical examination and laboratory tests made, the diet regulated, fluids and alkalies administered, if indicated, the field of operation prepared, and the patient will become acclimated to his surroundings.

Mental State.—It is well known that fear has a great influence on the physical condition of the patient, especially in relation to shock, and the psychic influence of the surgeon and hospital attendants is an important factor in preparing a patient for operation. When the patient has confidence in his surgeon, and the hospital attendants show that they know what they are about, without undue bluster, it imbues the patient with assurance, and goes a long way towards a comfortable convalescence. Visitors should be mostly excluded, because, as a rule, they think of the improper things to say to a patient. The patient should be kept quiet, so that he can sleep well and reach the operating table without fear.

Hospital Records.—It is important that an accurate history, written in descriptive phraseology, be recorded, and that a proper interpretation be made of this history. A thorough physical examination should be made and recorded, paying special attention to the heart, lungs, kidney function and blood pressure. Necessary laboratory tests should be made and recorded: while laboratory findings are not conclusive, yet when properly correlated to the physical findings, they are a valuable aid in modern diagnosis.

Special Preparation.—Throat and mouth should

*Read before the Southern Minnesota Medical Association, Mankato, May, 1924.

be examined, and the presence of an acute respiratory infection should be noted and treated, postponing operation until a satisfactory condition can be attained. A dirty mouth or an acute infection in the nose and throat often leads to serious post-operative conditions, especially when an anesthetic is given. Digitalis is a great help in supporting the heart and circulation, especially when a serious operation is undertaken, and where there is evidence of myocardial weakness and circulatory incompetence. Digitalis for two or three days before operation is often a great help in turning the tide towards a good recovery. It is much better than stimulation with strychnia or whiskey. Quick acting stimulants should be used only as a whip in an emergency, and never in the preparation of a patient.

Fluids.—It is usually wise to give plenty of fluids by mouth, and, if necessary, by rectal drip or intravenously. The addition of alkalis improves the general state of the body, especially when exhausting disease or starvation tends to a condition of acidosis. One can give fluids to within a short time of the operation with benefit.

Cathartics.—A much abused method of preparation consists in giving excessive cathartics. These produce congestion, sometimes acute enteritis, and often dehydration, and may cause post-operative vomiting, tympanites and so-called gas pains. Where a patient's bowels have been normal, no physic should be given. Under no circumstances should a cathartic be given within forty-eight hours of the operation. Much better technique consists in a careful and thorough colon flushing with normal salt solution, than any other method of bowel preparation.

Preparation of the Local Field of Operation.—A good routine, when there are no contraindications, is to give the patient a general bath or a sponge bath the day before, to carefully shave the field of operation without causing irritation, put on a clean binder and do nothing else until immediately before operation, when, depending upon the choice of the operator, benzene, followed by iodine and alcohol, or 5 per cent picric acid solution, or phenoco solution should be used, the object being to cleanse the superficial skin and not attempt a thorough skin sterilization. It is impossible to reach the bottom of the fat, sweat and hair follicles, and during an operation, these will empty on the skin, no matter what previous preparation

has been undertaken. If the skin is irritated, there is a greater danger of infection than otherwise. After cleansing, and the use of one of the above mild applications, protection of the skin with sterile towels is sufficient and efficient. We desire cleanliness, not irritation. In females, a cleansing but not an antiseptic douche is best, and if vaginal work is to be done, then a cleansing with a mild lysol solution meets the indication. Iodine is sometimes used, but there is a great danger of subsequent irritation, and this should be avoided. To sum up the preparation of the field of operation, we must emphasize that if we are reasonably clean, use mild applications, and avoid irritation by proper skin protection with drapes, then we meet the indication, and do not predispose to subsequent infection.

Morphine with scopolamine or atropine is indicated in most cases, as it quiets the patient, facilitates the giving of a general anesthetic, and keeps the patient quiet after operation. Judgment must be used in this, depending upon the case, and the general make-up of the patient. It is sometimes wise to give the patient 8 or 10 grains of veronal the night before, to assure a good night's rest before operation.

Every surgical clinic should have at hand grouped blood donors, materials and equipment for giving intravenous saline or hypodermoclysis, and a supply of fresh adrenalin to be used when loss of blood or shock occurs.

Special Operations.—In certain fields or types of operation, special preparations are indicated, and it is in these cases that such wonderful progress has been made in modern surgery, and mortality as well as morbidity has been greatly reduced. First, it is wise for each tonsillectomy case to have a urinalysis, lung examination and blood coagulation test made beforehand, to ward off any alarming emergencies. Second, goiter; the proper selection of cases for operation, depending upon the type of goiter, the history of the case, the rate of metabolism and amount of degenerative changes locally as well as in the important organs of the body, has increased the operability and improved the operative mortality materially. Preliminary rest, the use of Lugol's solution, operation in several stages, from simple ligation to complete thyroidectomy, with or without immediate closure of the wound, must all in turn be used, depending upon the indication; and keen judgment and pa-

tience bring their own reward. Biliary infections require, above all, a knowledge of the coagulability of the blood, and, where this is slow, the preliminary intravenous injection of calcium chlorid solution, giving 5 c.c. of a 10 per cent solution daily for two or three days, as indicated, a treatment which Doctor Wolters has brought before the profession and emphasized with illustrious results; it has been a great saver in gallbladder operations. Diabetic cases in need of surgical care require a careful preliminary preparation, with the establishment of a proper sugar tolerance, with or without insulin. Where formerly a diabetic gangrene in the toe required an amputation above the knee, we now, with the patient in the proper condition, can often ablate the dead tissues without interfering with the local circulation, and find almost normal granulation and healing as our reward. Prostatectomy cases should have the proper kidney secretory balance established before operative procedure is undertaken. The bladder should be decompressed gradually, watching the blood pressure until it is stable, checking the excretory function, and noting the blood retention of creatinin and blood urea or non-protein-nitrogen; and with the two-stage operation we can promise definite results, where formerly it was a hazardous and doubtful undertaking. As mentioned before, in cases with myocardial or circulatory unbalance, the giving of digitalis for two or three days beforehand is of great help.

Record of Operation.—It is always wise to note carefully the pre-operative diagnosis as well as the post-operative diagnosis on the chart at the hospital, to note the findings, as well as all the operative steps undertaken; the type of incision and the kind and location of drains and sutures should be noted.

Post-operative Care.—Transportation of the patient from the operating room to the bed should be made so as not to disturb sutures and drains. A competent doctor or nurse should accompany the patient, and stay with the patient until he is out of all danger. The patient should be protected against exposure; the bed, properly prepared beforehand and warm, should be in such a position of head elevation or foot elevation as is indicated by the operation. Position of the bed and posture of the patient mean a lot in the prevention of adhesions, phlebitis, embolus, and in the treatment of shock. A rectal drip should be used, when indi-

cated; but unless there is shock or a poor circulation, it is wise not to use it, since it tends to cause gas pains and nausea. We find a good method to be one in which the can containing the fluid is placed on a table, level with the rectum, and a short tube, just long enough to pass the sphincter, is inserted and left in situ. The rectum will absorb fluid according to the amount it can absorb, and the patient will expel gas through the can. For this an alum solution or normal salt solution serves well. The nurse, of course, should note the condition of the pulse, temperature and respiration, the facies and mentality of the patient, the amount of excretion, such as bile, urine, etc. If there is cardiac weakness, digitalis might be indicated. If there is dilatation of the stomach, gastric lavage and placing the patient in a prone position relieves the mesenteric pull on the duodenum, which is usually responsible. The giving of fluids may be started almost as soon as the patient desires them, hot water being best. It is easier to vomit with water in your stomach than with an empty stomach. The giving of food should be started as soon as conditions permit. Paralytic ileus without mechanical obstruction is best treated by gastric lavage, prone position of the patient, the introduction of a colon tube and, if necessary, a high and early enterostomy. Mechanical ileus requires a high enterostomy and secondary operation, before it is too late. The bladder should be watched, and if the patient cannot void spontaneously, and all routine attempts have been made, and the patient is in discomfort, there is no harm if catheterization is done *properly*, and a solution of argyrol, lunosol or other suitable antiseptic is immediately put into the bladder before withdrawing the catheter. After each operation the kidney function should be watched, which can be best stimulated by the introduction of fluids into the body.

Bowels.—The after care of the bowels is important. Do not give cathartics if you can help it. The use of a rectal tube, the above mentioned method of using a can on the level with the rectum, or a bowel irrigation meets the indication better.

Pulmonary Embolus is a tragic occurrence which we can never predict. In serious operations on the pelvic organs or rectum, it is important that the patient be kept quiet for twelve days, and that no large enema or cathartic be used. Elevating the foot of the bed to improve the return circulation from the lower extremities is important, espe-

cially when there has been infection in or near any of the important pelvic vessels.

Secondary collections of infectious fluids should be looked for and drained when they occur.

Dressings should be made with the "hands off" technique, with forceps. The wound should be inspected twenty-four or forty-eight hours after operation; the dressings should be changed at the proper time. In removing sutures, it is better to cut them one day and remove them in twenty-four or forty-eight hours. Because wounds are infected, one should not be careless in changing dressings, since you can get another type of infection which is worse than the first. This is especially important in traumatic injuries of the extremities, and

we find that even in the presence of infection, if we treat the whole limb just as carefully as if we were preparing an abdomen for operation, and keep the whole limb protected with sterile drapes during the healing process, we get kindlier healing and better function.

We think it is a wise plan to give the patient a record of the operation—in other words, an inventory of his remaining as well as his missing organs, for obvious reasons; both for his own information, as well as for the use of any further medical attendants.

A follow-up record of each surgical case works for the benefit of the patient, as well as of science, and in such institutions where social service can be had, it is worth while.

GOOSE GREASE FOR HAPPINESS

Any young interne in a loud-smelling hospital will tell you that the all-wise "Doc" of our boyhood days was an animated reservoir of ignorance. Likewise, the trained nurse with the hazel eyes will assure you that the old ladies who used to group themselves around every sick bed were merely advance agents for the village undertaker.

Bread-and-milk hot-packs are not what they used to be. The bag of "assifidity" hung around the neck is not recognized by Johns Hopkins as a preventive of measles. Serum takes the place of goose grease.

Physicians revise all of their beliefs every forty years. If the long-whiskered practitioner of the eighties, who could cure anything with calomel and morphine, is derided by the specialists of today, may we not predict that the present crop of specialists will be laughed at by the super-specialists of 1950?

They tell us that all of the pallid heroines of history were not broken-hearted, as reported. You can't break a heart. It is a combination of outer casing and rawhide. All of the anemic maidens we have read about were suffering from a lack of vitamins. The balanced ration may take most of the romance out of the world. It is almost impossible to be in love and feel well at the same time.

A venerable lady who smoked a pipe told me, many years ago, that white walnut bark should be peeled from the tree in the dark of the moon. If peeled upward, it was a purge. If peeled downward, it was an emetic. She spoke with much conviction.

The pin-feathered medical student will say that the old lady was daft. How does he know? Has he ever tried out white walnut bark in a large number of cases, working in

the dark of the moon, peeling first upward and then *vice versa*? He won't even admit that sassafras tea, taken in the spring, thins the blood which has become all thickened up with sausage and buckwheat cakes during a long winter. This, in spite of the fact that millions of people have actually diluted themselves with sassafras, and are ready to make affidavits.

We come now to the buckeye or petrified potato, carried in the trousers pocket as an antidote for rheumatism. No sense to it? Well, it's just as easy to explain the buckeye as it is to explain the radio.

If a large number of trustworthy citizens and God-fearing women testify that a woolen sock around the neck will drive away sore throat, that turpentine and sugar will cure a cold, that mutton tallow, gunpowder and a certain bittersweet bark cooked up together will dispel the itch, that catnip will relieve indigestion and skunk oil invariably banishes bronchial inflammation, while a flaxseed poultice will often do just as much good as a trip to the Mayos, how can we go against such a mass of evidence?

Out in the brush there is still an occasional old-fashioned mother who keeps the baby lubricated and calmed down by permitting it to work on a strip of bacon rind. This is contrary to all rules. The babyologists say that a young and toothless child requires orange juice. Yet thousands of bacon-rind babies have grown up to be congressmen, chiropractors, county agents, actresses and officers in the Federation of Women's Clubs.

Let Dr. Billings and the Harvard savants say what they will, when the children out our way begin to act squirmy, we will give them pumpkin-seed tea.—George Ade, *The Cosmopolitan*, September, 1924.

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EDITORIAL

The St. Cloud Meeting

This recent meeting, and notably certain expressions in the House of Delegates, indicates the firm conviction of a large number of members, that larger portions of future programs must be clinical in character. This is a logical stand and while an outgrowth in part of the splendid accomplishments of the now famous Tri-State gathering, is not entirely the result thereof. We have had the various Clinic Weeks with an ever larger number of small special society group meetings, in which stereotyped papers have long been "taboo." Nevertheless, these clinical meetings will not go unless they are held rigidly to some form, structure, and sequence; unless each clinician has some message which he can effectually mobilize and present. "Clinic Weeks" cannot for example gravitate into marathons from hospital to hotel or meeting place, with only a scattering attendance at many of the sessions. Any sort of a preacher needs someone in the pews; only a fanatic can be eloquent in a hollow cave.

This is no academic and immaterial problem when we survey what actually happens to our medical programs and the St. Cloud meeting is fresh enough in our minds to make certain reviews useful. Both sections had very fine programs and the joint sessions were noteworthy and timely. Yet the sessions of Thursday began with only a "baker's dozen" on the benches; the men who came arrived late and were not ready to attend the session until most of the papers had been given. The suggestion was passed out by some that the place of meeting was not sufficiently central; that the Twin Cities should be the logical and constant meeting place. The St. Cloud committee had made arrangements for the physical comfort and mental relaxation of those who attended that have never been surpassed by any city in Minnesota acting as our host. A paved road made it only two hours further than the Twin Cities for anyone residing near thereto, and it brought the meeting to those in the west and northwest a little closer than ever before. Much argument may be advanced in favor of a constant central meeting place, but it must never be forgotten that large attendance records in large centers can easily represent the registration of a definite percentage of local men who only grace the banquet or smoker by their presence, or direct the golf tournament.

Finally, the joint session of Thursday afternoon brought to Minnesota (distinctly through the efforts of Dr. Charles Hensel) the most noteworthy presentation of the whole meeting: Dr. Carl R. Moore, of the University of Chicago, came, with a most interesting review of his work on the testes and the function of the scrotum. The Steinach episode in medical research has brought a deal of unpleasant notoriety to our profession that can only reflect the subumbilical seat of the intelligence in a considerable segment of the body politic. In so far as our profession has lent itself to the exploitation of the ideas concerned, we indicate fully our own incorporation into that segment. Dr. Moore's orderly, instructive, dispassionate and convincing researches indicate clearly the facts involved and the general futility of Steinach's attempt at rejuvenation. Due to the fact that the *early and late* sessions of every program received scant courtesy and attendance, he had, with the other excellent men of the Friday afternoon program, a very small audience.

New Year's is our usual time for sublimity and

resolutions. Let us anticipate that event somewhat while certain matters are fresh in our minds: Let us here and now resolve that whenever and wherever we attend medical meetings, we will make early hotel and banquet reservations, and we will come early and stay late.

E. L. T.

Scarlet Fever

At a time when doubt has been expressed as to the specificity of the streptococcus in disease, it is extremely interesting to find that so familiar a disease as scarlet fever may be definitely attributed to a specific streptococcus. Dochez, Tunnicliff, and others had shown that the streptococcus, which could be isolated in practically 100 per cent of the cases of scarlet fever during the week of onset, gave specific immunologic reactions. It remained for Dick and Dick to show that the disease can be experimentally produced by the application of a particular streptococcus to the throat of susceptible adults. In their investigations they were able to rule out the possibility of an ultra-microscopic virus and to show that it was definitely the streptococcus that was the etiologic factor. Their results are further of interest in showing that the cultural characteristics of the organism were not identical in the 100 cases studied, 84 per cent of the organisms fermenting manite and 16 per cent not doing so. The fact that they were able to produce scarlet fever with an organism of each type indicates that the cultural characteristics need not be the same, although the identical clinical picture is produced.

Dick and Dick have fulfilled all four of the canons of Koch in their demonstration of the streptococcus as the etiologic factor in scarlet fever. In their later work they were greatly helped by their skin test for susceptibility to scarlet fever. This is comparable to the Schick test in diphtheria. The filtrate of the streptococcus is injected intracutaneously and the result read after twenty-four hours. By means of this test susceptibility to scarlet fever can be determined. By repeated injection of the same antigen, they were able to immunize patients against scarlet fever.

Dick and Dick, as well as Dochez and his co-workers, have produced a scarlet fever antitoxin. The results to date seem to show that this antitoxin is useful in the acute toxemia of scarlet fever similar to the toxemia of diphtheria. If it is to be

used, it must be given in the first days of the illness. Progress has been made both in the treatment of the acute stage of scarlet fever and in the prevention of the disease itself.

H. F. H.

Dr. Archibald MacLaren

The passing away of Dr. MacLaren leaves a gap in our ranks which it will be difficult to fill. His absence at our state meeting in St. Cloud due to his illness was sorely felt but his departure so soon after the convention came as a shock to most of his friends and acquaintances.

The presidency of our state organization is an indication of the esteem felt for Dr. MacLaren by his fellow members. The position he held in the medical profession of the state was truly enviable. He was one of the outstanding figures in surgery of the Northwest, a position he not only held because of his long professional experience, industry and natural ability but because of his unusually fine character. Perhaps the outstanding quality was his absolute honesty in all his dealings. His friends at times feared his openness would work to his detriment. It never did.

While we have lost a friend, those who knew him will always retain the inspiration of his life.

Dr. Frederick Lee Beckley

As a sad coincidence, we are called upon to report the death also of our treasurer, Dr. Frederick Lee Beckley, Treasurer of the Minnesota State Medical Association for six years, he was again re-elected at the last annual meeting. Those of us who were at the St. Cloud meeting saw our friend, Dr. Beckley, who seemed in the best of health and just as keen for a round of his favorite game of golf as he ever was.

Dr. Beckley attained the enviable position he held in his community and among his professional associates through his real worth. As president of the Minnesota Transfer state bank, he was active in the business life of the Merriam Park district of St. Paul, as well as serving it professionally.

Those of us who knew Dr. Beckley will always remember that he played the game of life fairly and played it well. What more can be said of a man?

OBITUARY

DR. ARCHIBALD MacLAREN

Dr. Archibald MacLaren, leader of long standing in the medical profession in St. Paul and the Northwest, died early Sunday, October 12, at his home, 353 Summit avenue.

Death was due to an affliction of the heart, with which he had been suffering for two years, but which did not become acute until recently. Until serious illness overtook him he carried on the practice of surgery and the duration of his service to the profession placed him among St. Paul's oldest surgeons.

Long service and widely recognized abilities imposed many distinctions on him. He was chief of the staff of St. Luke's hospital, member of the staff of the Miller hospital, fellow of the American College of Surgeons, member of the American Surgical Association and the American Medical Association, state and county medical associations and he had been associate attending surgeon at the University hospital and professor of surgery at the University of Minnesota. He was president of the Minnesota State Medical Association at the time of his death.

Dr. MacLaren was born in Red Wing in 1858 and, with the exception of the years given over to education, he remained virtually all of his life in this state. When he was 10 years old he came to St. Paul with his father, General Robert N. MacLaren, celebrated Indian fighter, who was one of St. Paul's influential citizens in the days when the frontier was near at hand.

Dr. MacLaren received his early education in St. Paul grade and high schools and his academic preparation for medical study at Princeton university, from which he was graduated in 1880. He received his professional education at the College of Physicians and Surgeons of Columbia university. Then for two years he was an interne in the New York Women's hospital, after which he returned to St. Paul.

His first professional association was with Dr. Edward C. Spencer in 1885. Later he was associated with Dr. C. A. Wheaton, with whom he practiced until 1896. Two years later he joined with Dr. Harry P. Ritchie, and that association grew until at the time of Dr. MacLaren's death, it included Drs. MacLaren, Ritchie, Louis E. Daugherty and Harry Oerting.

Surviving him are the widow, who before her marriage in 1839 was Miss Katherine Dean; three children, Margaret, Katherine and Archibald MacLaren, and a sister, Mrs. George E. Ingersoll.

DR. HORACE H. WITHERSTINE

Dr. Horace H. Witherstine, 72 years old, prominent Rochester physician and former state senator, was killed Thursday, October 2, when the car in which he was driving skidded and turned over on a highway two miles north of town. Dr. Witherstine was alone in the car when the accident occurred and was on his way to make a rural call.

Dr. Witherstine for many years practiced medicine in Olmsted county and always took a prominent part in poli-

tics in that district. He was elected to the state senate in 1902 and was re-elected four years later. He also served two terms as mayor of Rochester in addition to serving as alderman and member of the school board at various times. In 1916 he was democratic nominee for congress from his district.

Dr. Witherstine was born at Herkimer, N. Y., April 14, 1852. His early life was spent on a farm and later he taught school for 10 years. In 1882 he began the study of medicine and was graduated from Rush Medical College, Chicago, in 1886, later locating in Rochester.

Dr. Witherstine for several years was editor of the Rochester Bulletin, which is now owned and operated by his son, Glenn. Besides this son he is survived by his widow, one other son, Dr. William H. Witherstine, Grand Forks, N. D., and Mrs. Russell Drake, of Rochester, a daughter.

DR. HENRY EDWIN DOUGLASS

Dr. Henry Edwin Douglass was born at Napanee, Ont., on February 14, 1868. His preliminary education was obtained in the Napanee Collegiate Institute and his medical education in the Medical Department of Queen's University, at Kingston, Ont., from which he graduated in 1892. He began his professional life at Morrisville, Vt., locating there five years before going to Iowa. For fourteen years he practiced at Independence, Ia., and the following four years at Hutchinson, Minn. His Minnesota certificate was issued in 1914. He served twenty-three months in the U. S. Army Medical Corps. For the past five years he resided at Blackduck, Minn., and was active in practice up to two or three days before his death, which occurred on June 14th of this year from acute dilatation of the heart. For the past four years he has been a member of the Upper Mississippi Medical Society and the Minnesota State Medical Association. He is survived by his wife, Mrs. Mabel Douglass, and daughter, Agnes. The funeral was held from his home at Blackduck, under the auspices of the Masonic Lodge, and remains interred in the Lakeview Cemetery.

IN MEMORY OF DR. ROBERT HYNDMAN MULLIN

The Administrative Board of the Medical School learns with regret the death of Dr. Robert Hyndman Mullin, formerly a member of this faculty, an associate professor of pathology and bacteriology, and an officer of the Minnesota State Board of Health.

He did valuable service for the Medical School during the years of his association with it. He was an earnest teacher, a good executive, a competent laboratory director. He gave himself unsparingly to the promotion of medical education and public health.

The faculty extends to his family the sympathy of its many members who remember Dr. Mullin kindly for his many sterling qualities and gratefully for the educational service he rendered to the State of Minnesota.

E. P. LYON,
Dean.

RICHARD OLDING BEARD,
Secretary.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

THE STATE MEETING

The annual meeting of the Minnesota State Medical Association was held at St. Cloud October 8, 9 and 10, 1924. The registration was 310 of the total membership of 1,952 in the Association. While this registration was the smallest for several years, the attendance at the various scientific meetings was fully as good as usual. This may be accounted for by the fact that most of those in attendance stayed for a longer portion of the program than is usually the case when the meeting is held in the Twin Cities.

In the House of Delegates the matter that received most discussion was the advisability of a full time secretary, a matter which has been brought up from time to time and a step which undoubtedly would react to the benefit of the Association. The expense of such a step makes it prohibitory without a substantial increase in the state membership dues. There was considerable opposition to any increase in dues and so the matter of securing an executive secretary, who will be able to devote more time to field work, was left to a committee appointed by the Council.

The desirability of employing a full time secretary is doubted by no one acquainted with Association activities. Few perhaps realize the amount of detail work which the affairs of an association of physicians numbering close to 2,000 entails. The present executive secretary has developed a fine system of bookkeeping and files for handling the secretarial work and the Association has been fortunate in having such competent service.

The program this year was excellent. Few physicians plan to be present at the opening and closing addresses of a convention and this year was no exception. The last session was a combined meeting and the attendance dwindled pitifully. Most of the members had to leave early in order to get home for dinner at a seasonable hour. It will be interesting to see how the recommendation of the House of Delegates, that there be more combined meetings and more clinical presentations next year, will work out.

The approval of the lay journal known as the Northwest Health Journal and published by the Minnesota Public Health Association was voted by the House of Delegates. It was also voted to continue the appropriation for assisting in the Public Health Exhibit at the State Fair next year.

The following officers were elected for the year 1925:

President—W. L. Burnap, M.D., Fergus Falls.

First Vice President—A. S. Hamilton, M.D., Minneapolis.

Second Vice President—John Libert, M.D., St. Cloud.

Third Vice President—C. W. More, M.D., Eveleth.

Secretary—Carl B. Drake, M.D., St. Paul.

Treasurer—F. L. Beckley, M.D., St. Paul.

COUNCILORS

First District—G. S. Wattam, M.D., Warren.

Fourth District—W. H. Condit, M.D., Minneapolis.

Seventh District—F. A. Dodge, M.D., Le Sueur.

DELEGATES TO THE AMERICAN MEDICAL ASSOCIATION

Delegate—J. L. Rothrock, M.D., St. Paul (2 years).

Alternate—J. G. Cross, M.D., Minneapolis (2 years).

Delegate—T. L. Chapman, M.D., Duluth (2 years).

Alternate—Theo. Bratrud, M.D., Warren (2 years).

The invitation extended by Minneapolis to hold the convention there next year was accepted. The time tentatively determined upon by the Council was the second week in October.

LYMANHURST AND PARKVIEW STAFF MEETING

The regular monthly meeting of the Lymanhurst and Parkview medical staffs will be held at Lymanhurst School, 1800 Chicago Avenue, Minneapolis, Tuesday evening, November 25, at 7:00 o'clock.

Following is the program for the evening:

"Tuberculosis and Diabetes," Dr. L. F. Richdorf.

"Diet and General Therapy in Tuberculosis in Children," Dr. Fred W. Schlutz.

"Pleural Effusions and Operative Procedures in Tuberculosis and Other Closely Allied Conditions in Children," Dr. E. J. Hucnens.

"Intestinal Tuberculosis and Closely Allied Conditions in Children," Dr. Rood Taylor.

All persons interested in tuberculosis are invited to attend these meetings and participate in the discussions.

MINNESOTA MEDICAL ALUMNI ASSOCIATION

A meeting of the Minnesota Medical Alumni Association was held in St. Cloud on October 10, 1924. President Dr. Paul B. Cook was in the chair.

The following officers for the ensuing year were elected:

Dr. O. N. Meland, Warren, Minn., President.

Dr. J. Warren Bell, Minneapolis, Vice-President.

Secretary and Treasurer, as formerly, Dr. Donald Daniels, Minneapolis.

Dr. E. P. Lyon, dean of the medical school of the University, addressed the meeting and discussed some of the problems confronting the medical school and medical education in general.

The President, Dr. O. N. Meland, appointed the following men to fill vacancies occurring upon the Advisory Committee to serve for a period of three years:

Dr. S. P. Rees, Minneapolis; Dr. E. L. Tuohy, Duluth; Dr. Paul B. Cook, St. Paul; Dr. Carl O. Estrem, Fergus Falls. Also as Medical Representative at Large, Dr. S. E. Sweitzer, Minneapolis. J. WARREN BELL, Acting Secretary.

AMERICAN WATER WORKS ASSOCIATION MINNESOTA SECTION

The fourteenth annual meeting of the Minnesota Section of the American Water Works Association will be held in the main engineering building, room 305, at the University of Minnesota, November 14, 1924. The session begins at 9:30 A. M. and the program includes subjects pertaining to public health questions which will be of interest to the medical profession.

The subjects which will be discussed include: "Problems Dealing With the Elimination of Lubricating Oil in the Water Supply Which Has Been Introduced Through the Pumping Equipment," "Stream and Lake Pollution," and "Simple Goiter: Its Prevalence and Prevention."

OF GENERAL INTEREST

Dr. Harry T. Frost, formerly of Hallock, has moved to Crookston for the practice of his profession.

Dr. W. F. Bleifuss, Rochester, has discontinued his work as city health officer at Rochester, and plans to retire from medical practice entirely the first of this month.

Dr. Fred W. Behmler, formerly of Lafayette, has taken over the practice of Dr. M. J. Fiksdal at Appleton, Minnesota, where he has been located since September.

Dr. Carl M. Oberg, Minneapolis, with his wife and daughter, Margaret, has returned from a five months' trip in Europe. Dr. Oberg spent two months in the eye and ear clinics of Vienna.

Dr. Robert Emmett Farr read a paper before the Linn County Medical Society, September 11, at Cedar Rapids, Iowa, and another before the Pennsylvania State Medical Association meeting at Reading, Pa., October 8th.

Dr. Arthur Margot, formerly Pathologist and Director in Charge of the Milwaukee County Laboratories, Milwaukee, Wis., has recently accepted the position of Pathologist and Director of the Clinical Laboratory with the Sioux Falls Clinic, Sioux Falls, S. D.

Dr. George E. Fahr, Minneapolis, read a paper on "The differential diagnosis of rheumatic fever and subacute bacterial endocarditis" before the meeting of the Minnesota Pathological Society, held at the Institute of Anatomy building, University of Minnesota, Tuesday evening, October 21.

The new Hudson-Towers hospital-hotel in New York City, representing an investment of \$3,500,000, is nearing completion. This new hospital-hotel combination is to be an open hospital and will meet a definite need. The unique combination of hospital for the sick and hotel for the relatives is particularly needed in New York, where such a large percentage of the population lives in hotels.

The 1924 roll call of the American Red Cross, to enroll members for 1925, will be held from Armistice Day to Thanksgiving Day, November 11 to 27. The membership this year is well over three and a quarter millions, with an additional junior membership of five and a half millions. The service of the American Red Cross is increasing and daily proving its value and it is felt that increase in membership is essential to its proper development.

Announcement has been received of the Warren Triennial Prize to be awarded for the best dissertation considered worthy of a premium on some subject in Physiology, Surgery, or Pathological Anatomy; the arbitrators being the General Executive Committee of the Massachusetts General Hospital, Boston. The prize was founded by the late Dr. J. Mason Warren in memory of his father.

The rules of the competition are as follows:

Dissertation must be either in the English, French, or German language, and must be typewritten and suitably bound, so as to be easily handled. Work that has been published previously will not be considered in competition. The name of the writer must be enclosed in a sealed envelope, on which must be written a motto corresponding with one of the accompanying dissertation. The amount of the prize for the year 1925 will be \$500.00. Dissertations will be received until April 15, 1925, and should be sent to

Dr. Frederic A. Washburn, director of the Massachusetts General Hospital.

University News.—More than \$3,000,000 for the support and extension of instruction in medicine, nursing, and allied fields, has been received as gifts by the University of Minnesota in the past 12 years, President L. D. Coffman told those who attended the cornerstone laying for two hospital units on the University of Minnesota campus, Wednesday, October 1.

He enumerated these gifts as follows:

\$120,000 from the heirs of Dr. Adolphus F. Elliot for the Elliot Memorial hospital.

\$42,000 from various Minneapolis citizens for the hospital site.

\$1,500,000 from the Mayo Clinic to be used as the Mayo Foundation, which sum has been increased by accumulated earnings to \$2,090,000.

\$1,000,000 from William Henry Eustis for a hospital and home for crippled children. (Final payment to be made by July 1, 1927.)

\$20,000 from Mrs. Frank C. Todd, \$20,000 from Mrs. E. C. Gale, and \$5,000 from Mrs. Emery Mapes for the Todd Memorial Eye, Ear, Nose, and Throat hospital.

\$250,000 from the Citizens Aid Society of Minneapolis for the George Chase Christian Memorial Cancer Institute.

President Coffman sketched the history of medical education at Minnesota during the past 12 years and said that the erection of Elliot hospital marked an era in the life of the Medical School.

"Another era was begun," he said, "when Drs. W. J. and Charles Mayo gave to the university \$1,500,000 with the understanding that the interest from this endowment would be converted back into the principal until the total reached \$2,000,000, and with the further understanding that the income would be devoted thereafter perpetually to research in the fields of medicine and surgery. Two years ago this magnificent gift with its accumulated earnings reached the sum of \$2,090,000, which means that the University has annually from this source alone more than \$100,000 for the study of problems relating to human health.

"Although the Mayo Foundation has been in existence since 1915, from the very beginning the Mayo Clinic has contributed out of its resources between \$200,000 and \$300,000 a year to the Foundation for the scientific study of human diseases. Today we are expending approximately \$350,000 a year, which is the income from the Mayo Foundation and the annual gift of the Mayo Clinic, to maintain graduate work in medicine and surgery at the University of Minnesota. In this respect, Minnesota is unparalleled among the medical schools of the world.

"For twelve years Elliot hospital has stood alone. Now, again, we come together to celebrate the laying of the cornerstones of two new hospital units," he said, "one for diseases of eye, ear, nose, and throat, made possible by the gifts of Mrs. Todd, Mrs. Gale, and Mrs. Mapes, supplemented by funds of the University, and the other to be devoted to the study of cancer, made possible by a gift of \$250,000 by the Citizens Aid Society, which was founded by Mr. George Chase Christian. These two new hospitals mark another step in the development of medical education at the University of Minnesota."—University of Minnesota News Bulletin.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

ABBOTT LABORATORIES:

Metaphen

Metaphen Solution 1:5,000

SWAN-MYERS COMPANY:

Sterile Ampules of Mercury Benzoate, 2 per cent

Sterile Ampules of Mercury Biniodide (Oil Solution)

Sterile Ampules of Mercury Salicylate, 0.097 Gm.
(1½ Gr.)

Sterile Ampules of Mercury Salicylate, 0.065 Gm.
(1 Gr.)

Sterile Ampules of Mercury Succinimide, 0.01 Gm.
(⅓ Gr.)

NEW AND NON-OFFICIAL REMEDIES

Medicinal Dyes.—The dyes which are used in medicine may be divided into five classes: (1) the azo dyes, of which scarlet red medicinal and scarlet red sulphonate are described in New and Non-official Remedies; (2) the acriflavine dyes, such as acriflavine, neutral acriflavine and proflavine; (3) the fluoresceine dyes, usually combined with metal mercury such as mercurochrome—220 soluble and flumerin; (4) the triphenolmethane or rosaniline series, such as gentian violet, crystal violet, methyl violet and fuchsin; and (5) miscellaneous dyes, such as methylene blue, phenolsulphonaphthalein and tetrabromphenolphthalein. In order to obtain comparable results when employed clinically, dyes should be of constant composition. The triphenolmethane (rosaniline) dyes include fuchsin and the closely related violet dyes, gentian violet, crystal violet and methyl violet. Of these, gentian violet is the one that has been used chiefly in medicine. It is stated to have the property of great penetration; to be bactericidal also bacteriostatic in vivo toward selective organisms. Its chief use has been in the treatment of infections of the pleural cavity and of the joints. The intravenous use of gentian violet has also been proposed in staphylococcus septicemia, chronic cystitis, osteomyelitis.

Gentian Violet Medicinal.—A mixture of pentamethylpararosaniline and hexamethylpararosaniline chlorides. For direct application, a solution of from 1:500 to 1:1,000 may be employed; for instillation, a 1:10,000 solution. For intravenous use, 5 Mg. per Kg. of body weight, injected in 0.5 per cent solution has been used.

Gentian Violet Improved Medicinal.—A brand of gentian violet medicinal-N.N.R. Colcman and Bell Co., Norwood, Ohio.

Gentian Violet Medicinal—"National."—A brand of gentian violet medicinal-N.N.R. National Aniline and Chemical Co., New York.

Insulin-Stearns Quadruple Strength.—Insulin-Stearns (see Journal A.M.A., June 14, 1924, p. 1937) marketed in 5 c.c. vials containing forty units in each c.c. Frederick Stearns & Co., Detroit.

Sulpharsphenamine-Squibb, 1 Gm. Ampules.—Each ampule contains sulpharsphenamine-Squibb (see New and Non-official Remedies, 1924, p. 68) 1 Gm. E. R. Squibb & Sons, New York.

Sulpharsphenamine-Squibb, 3 Gm. Ampules.—Each ampule contains sulpharsphenamine-Squibb (see New and Non-official Remedies, 1924, p. 58) 3 Gm. E. R. Squibb & Sons, New York.

Diphtheria Toxin-Antitoxin Mixture (new formula).—Diphtheria toxin-antitoxin mixture-Squibb (see New and Non-official Remedies, 1924, p. 298) marketed in packages of thirty 1 c.c. ampules. E. R. Squibb & Sons, New York.

Antistreptococcic Serum-Squibb.—Antistreptococcic serum-Squibb (see New and Non-official Remedies, 1924, p. 305), marketed in packages containing one 10 c.c. syringe; in packages containing one 50 c.c. vial. E. R. Squibb & Sons, New York.

Antistreptococcic Serum Rheumatic-Squibb.—Antistreptococcic serum rheumatic-Squibb (see New and Non-official Remedies, 1924, p. 305), marketed in packages of one 20 c.c. vial; in packages of one 50 c.c. vial. E. R. Squibb & Sons, New York. (Journal A. M. A., Sept. 6, 1924, p. 767.)

Ampules Pituitary Solution Wilson, 0.5 c.c.—Each ampule contains pituitary solution-Wilson (see New and Non-official Remedies, 1924, p. 229) 0.5 c.c. Wilson Laboratories, Chicago.

Thiosinamine.—Thiosinamina. Allylthiourea. Thiosinamine is being used against arsphenamine dermatitis. This use is still in the experimental stage. Thiosinamine was originally introduced to promote absorption of scar tissue, lymphatic swellings, etc. Its restricted use indicates that it has little if any value for this purpose. Although it is usually well borne, except for its bitter taste and acid eructation, it may produce toxic systemic effects, and these may set in suddenly after it has been used for a time without toxic effects. (Journal A. M. A., Sept. 13, 1924, p. 843.)

Oridine.—The calcium salt of the iodized fatty acids of cottonseed oil. It contains from 23 to 25 per cent of iodine in organic combination. Oridine acts in the system similarly to the inorganic iodides. The iodized fatty acid radicle of oridine is not decomposed in the stomach but a part of the iodine is split off when it enters the intestine. The undecomposed portion is readily absorbed and, as in the case of other fats, it is largely deposited in the tissues where it is slowly split up. As with other iodized fats, the action of oridine is exerted more slowly than that of the inorganic iodides. Oridine is marketed in powder and as oridine tablets for the prophylaxis of goiter, containing oridine equivalent to iodine 0.01 gm. Eli Lilly & Co., Indianapolis. (Journal A. M. A., Sept. 20, 1924, p. 921.)

Rabies Vaccine (Human), Phenol Killed.—An antirabic vaccine (see New and Non-official Remedies, 1924, p. 306) prepared according to the general method of David Sempel. The product as sold contains brain substance 2 per cent and phenol 0.5 per cent suspended in physiological sodium chloride solution. It is marketed in packages of fourteen vials and a syringe, and in a package containing 21 vials

and a syringe. Jensen-Salsbery Laboratories, Inc., Kansas City, Mo. (Journal A. M. A., Sept. 27, 1924, p. 1001.)

PROPAGANDA FOR REFORM

BioFood.—This is a "patent medicine" combination put out by a concern that seems to go under various names: "Biochemical Food Products Corporation," "Bio-Products Company," and "BioFood Corporation." BioFood has been shrewdly and cleverly marketed. The impression is given that the stuff is a food and not a medicine. Its high price—ten dollars a treatment—impresses the public with its value. The treatment consists of a box labeled "A" and two bottles labeled, respectively, "B" and "C." BioFood is sold with the claim that our bodies are composed of twelve tissues containing sixteen elements, that our foods are deficient in these elements and that BioFood supplies this deficiency and thus "builds up the body by supplying all the elements which nature intended man to have and thus gives nature a chance to create her own antitoxins and effect a cure." BioFood has been advertised extensively in newspapers, in self-styled medical journals and by cruelly mendacious advertisements in the Chicago street cars. The A. M. A. Chemical Laboratory reports that BioFood "A" may be considered to be composed essentially of milk sugar and flavoring in which have been incorporated small amounts of iron, calcium and manganese salts and phosphate, either as such or in combination such as glycerophosphate. The Laboratory found BioFood "B" to be tablets which may be considered to consist essentially of potassium acetate, sodium chloride, sodium sulphate and sodium citrate. BioFood "C" was a liquid resembling solution of iron and ammonium acetate, U. S. P., modified by the addition of very small amounts of calcium, magnesium and sodium and phosphate compounds. (Journal A. M. A., Sept. 6, 1924, p. 782.)

Mercurochrome-220 Soluble and Gentian Violet Intravenously.—Reports on the intravenous use of mercurochrome-220 soluble and of gentian violet have been published. These drugs, when administered intravenously, are used in recently prepared aqueous solution. Of mercurochrome, 5 mg. per kg. of body weight appears to be generally used. It is used in a one per cent solution. Of gentian violet, 0.25 per cent of an aqueous solution is used; the dosage being 5 mg. per kg. of body weight. Mercurochrome-220 soluble marketed by Hynson, Westcott & Dunning, Baltimore, gentian violet medicinal—"National" of the National Aniline and Chemical Co., New York, and gentian violet improved medicinal of Coleman & Bell Company, Norwood, Ohio, have been accepted for New and Non-official Remedies. (Journal A. M. A., Sept. 20, 1924, p. 942.)

Hectine.—Hectine is said to be sodium benzosulphoamino-phenyl-arsenate and, therefore, is similar in composition to the product "Atoxyl." Atoxyl is one of a class of arsenical preparations, the use of which has been generally discontinued in favor of the products of the arsphenamin type. Hectine has not been accepted for New and Non-official Remedies, nor has the American agent, George J. Wallau, Inc., requested such recognition by the Council on Pharmacy and Chemistry. (Journal A. M. A., Sept. 20, 1924, p. 942.)

PROGRESS

Abstracts to be submitted to Section Supervisors.

SUPERVISORS:

CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS
ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

MEDICINE

SUPERVISORS:

F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH
THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

RESULTS OBTAINED IN THE TREATMENT OF NON-PULMONARY TUBERCULOSIS: H. O. West (Tubercle, London, 1924). "Does the pulmonary specialist have a greater percentage of cures, i.e., quiescent cases, or, in short, have a greater average of good results than the specialist in non-pulmonary tuberculous cases?" The specialist in the non-pulmonary field claims that he is at a disadvantage when his results are compared with the results in the pulmonary field.

The non-pulmonary specialist has not only to contend with a general infection, a local morbid process and therefore to consider the arrest and the quiescence of the disease both general and local, but, in addition to these, he has to consider the functional orthopedic results. He can claim a case as "disease quiescent" and at the same time the functional result may be a failure. The case may be as follows:

A woman with pulmonary disease may recover with the loss of one lung and still live a long and useful life in her family. But should a man have an arm amputated he is immediately handicapped. No invention to date can overcome the handicap. Similarly, ankylosis of hip joints with faulty positions from tuberculous disease can not be said to be a very credible result. Yet in the few cases named they will be classified as "disease quiescent," and after two years as "disease arrested."

Comparing the "end" results of pulmonary cases and non-pulmonary, we find that in the pulmonary cases the "end" results are becoming more available for statistical reports. In the non-pulmonary the tubercular process may be arrested, but the orthopedic results are less flattering.

When we come to consider the statistics of the results of actual institutional treatment two important points at once appear:

The first is that the proximate, though not the remote, results are vitiated by the inclusion of cases which are

admitted with the disease already soundly arrested. This undoubtedly occurs.

The second point is that while comparisons are always odious, they are impossible unless like is compared with like, and it is therefore futile to compare the proximate results (and in any case I do not propose to offer any comparisons) of an institution which picks its cases and one which admits all and sundry. In one American institution the policy has changed from mixed cases to picked cases, so that the basis of results has altered. A uniform system must similarly be adopted as to "relapse" cases.

For example, a classification has been adopted by the metropolitan Asylums Board whose main groups are:

- Active disease, with slight deformity
- Active disease, with considerable deformity
- Active disease, with abscess
- Disease with sinus formation
- Disease of long standing

To pass finally to the more important remote results. The difficulty of obtaining reliable after-history information year after year is notorious. Some records of pulmonary cases exist and are classical, but the serious thing is that the surgical officer may go on in blissful ignorance of the fact that although he is quite happily rejoicing in his 75, 80 or 90 per cent of "disease quiescent" proximate results, a proportion which may be far from flattering is falling by the wayside with relapses or with steadily degenerating orthopedic results and drifting off into other institutions. This, of course, happens to all of us. It happens especially in all branches of surgery. The surgeon comparatively rarely sees his failures. They go elsewhere.

To summarize—the following general statements about the results of the treatment of non-pulmonary tuberculosis will eventually be supported statistically:

1. That the proximate result of prolonged institutional treatment is to bring about quiescence of the disease in at least 75 per cent of all cases of non-pulmonary tuberculosis.
2. That this result will be maintained in the after history of not less than the same percentage of all cases.
3. That the length of treatment required varies almost directly with the promptitude with which treatment is given after early diagnosis.
4. That the expectation of life will not seriously be diminished in early cases suitably treated, and that diminution will be due essentially to any resulting crippling.

D. FLEMING.

THE CASE AGAINST GASTRO-ENTEROSTOMY:
Donald C. Balfour (Jour. Amer. Med. Assoc., Aug., 1924). The results of gastro-enterostomy for duodenal ulcer were studied so that the procedure might be compared with the more radical operations which are now being advocated by European and American surgeons.

Sherren, the London surgeon, reported satisfactory results in 92.6 per cent of 500 cases, two or more years after operation. He also stated that "patients who go for two years without symptoms never develop them later."

One thousand patients who were operated on ten years or more ago, were the basis of the study reported in this article. Nine hundred and eighty-six patients had complained of pain before operation; only ninety reported a return of pain in any degree and only twenty-two of these considered it sufficient to return for re-examination.

Vomiting was a symptom in 611 of these cases before operation, and only twenty-five reported any recurrence of this symptom. Hematemesis, melena, or both occurred in 286 cases before operation, and recurred post-operatively in only 57 cases (5.7 per cent). Recurring ulcer, whether in the duodenum, stomach, or stoma, was reported in 3.5 per cent of the cases. Subsequent perforation did not occur in any case. Eighty-eight per cent of the patients were entirely relieved of the symptoms for which they sought aid.

An investigation by the Actuarial Society of America disclosed the fact that the life expectancy of people who had had gastro-enterostomies for duodenal ulcer was greater than that of the general population.

The operative mortality was less than two per cent. The failures of gastro-enterostomy are due to: (1) the performance of that operation without definite indication, (2) failure to remove attendant infections in the abdomen, infected teeth and tonsils, (3) coexistence of functional derangement of the stomach, and (4) coexisting pulmonary or cardiovascular disease in which cases a gastro-enterostomy may be ill advised. Other causes of disappointing results are: (1) a young patient, (2) a short and atypical history, (3) the "constitutional inferiority" type of individual, (4) a small ulcer without obstruction, (5) bad habits of living, and (6) technical errors at the time of operation. Failure to recognize the cases in which a disturbance of motor function of the upper gastrointestinal tract results in severe toxemia is a cause of an unnecessary mortality in this group of cases.

Sherren reports that the persistence of high acids after gastro-enterostomy is intimately connected with the production of ulcer.

In closing, the writer states that at present there is no conclusive evidence that there is any operation more useful than gastro-enterostomy in cases of duodenal ulcer and also that the gastro-enterostomy can be disconnected with ease and safety after the ulcer has healed, if desired.

W. P. HEREST.

SURGERY

SUPERVISORS:

DONALD K. BACON,
LOWRY BLDG., ST. PAUL
VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

THE PRESENT STATUS OF THE SURGICAL TREATMENT OF CHRONIC DUODENAL AND GASTRIC ULCER: Chas. H. Peck (Ann. of Surg., July, 1924). The success of the gastro-enterostomy to relieve symptoms lies in the fact that the irritating character of the stomach con-

tents becomes less and that it short-circuits the stomach contents and permits healing of the ulcer.

Chronic gastric ulcers should be managed differently than ulcers of the duodenum. The eradication of the ulcer should be a part of the operative procedure.

If the ulcer is near the pylorus, the author favors excision or destruction of the ulcer by the actual cautery, then to proceed with a gastro-enterostomy.

In gastric ulcers with marked inflammatory reaction, adhesions, and a patient in poor condition, it is sometimes advisable to make a gastro-enterostomy and a second stage for resection, if necessary.

Mid-gastric ulcers will frequently respond better to a trans-gastric resection than to a gastro-enterostomy.

In chronic ulcers of the duodenum and stomach, the choice of operation is very important and depends largely upon the type of ulcer; hence the author has divided them into four general classes.

1—Single anterior ulcers of the duodenum which may be treated by local excision.

2—Chronic indurated ulcers without obstruction, single, multiple and perforating, and most of these respond to the simple gastro-enterostomy.

3—Chronic ulcers with obstruction and in these gastro-enterostomy is the operation of choice.

4—Cases with severe hemorrhage, and these are frequently cured by gastro-enterostomy, although in some cases it is necessary to excise the ulcer.

Radical resection should be reserved for cases with:

1—Inflammatory mass or suspected malignancy

2—Cases complicated with gastro-jejunal ulcer (2 per cent)

3—No relief of symptoms following gastro-enterostomy

Success in gastro-enterostomy depends largely on surgical technique and the author's technique is described in detail.

L. D. POWELL.

APPENDICEAL FECAL FISTULA: J. B. Deaver (Ann. of Surg., July, 1924). In this article the author discusses the occurrence of fecal fistula in cases operated upon for acute appendicitis. In the Lankenau Clinic, appendicitis is grouped acute or chronic, since they find that practically all cases of acute appendicitis are partially or entirely gangrenous. If the gangrenous area is large, the patient frequently has a chill. A chill may also be due to thrombophlebitis of the veins of the meso-appendix and of those into which they drain.

Fecal fistula complicates appendicitis in the cases presenting perforation, abscess and drainage. There were 200 cases of fistula in the last 4,063 cases of acute appendicitis, or 5 per cent. In every case pus was present, requiring drainage. Cases showing perforation at the base showed a tendency to fecal fistula formation, owing to the amount of inflammatory reaction and the friability of the tissues relied upon for turning in the stump.

Of the 200 fistulae, 74, or 37 per cent, healed spontane-

ously; 97, or 48.5 per cent, required operative repair. The remaining 29 per cent either refused operation or failed to return for operative repair, having been sent home to recuperate. A period of trial for spontaneous closure was given, depending upon the patient's physical condition.

The type of operation depended upon the existing conditions. In 60 per cent of the cases, simple inversion of the fistulous opening by a purse-string linen suture reinforced by an additional suture line was sufficient. In 15 per cent, ileocolostomy was performed after inversion and reinforcement of the fistula. This was done in the cases where the regenerative power was doubtful. Twenty-three per cent presented either multiple fistula or else the fistula was so large as to preclude closure with maintenance of the lumen. In these resection of the bowel was done and an anastomosis performed.

Eighty of the 97 operated cases recovered and were discharged healed. In eight cases the fistula recurred and nine died after operation. Only 37 per cent of the entire series healed without surgical repair.

F. A. BOTHE.

THE TREATMENT OF ACUTE MECHANICAL INTESTINAL OBSTRUCTION BY TEMPORARY JEJUNOSTOMY: Walter Estell Lee and T. McKean Downs (Ann. of Surg., July, 1924). The seriousness of acute mechanical intestinal obstruction has been recognized for years and known to carry a very high mortality, which is not alone due to the obstruction but to the absorption of toxic material generated in the duodenum, probably from the pancreatic and biliary secretions.

The treatment therefore in these cases must be:

1—Remove toxic material as early as possible.

2—Relieve the distended bowel of its contents, which are paralyzing its musculature.

3—Restore the continuity of the intestinal lumen.

The extent of the surgery to be done depends upon the time the obstruction has been present, cases within twenty-four hours having good chances by relief of the obstruction alone; but cases of several days' duration have a paralytic condition of the intestine as well as the obstruction, so therefore it is better to simply do a high jejunostomy after the method of Witzel, which places a soft rubber catheter into the distended loop. This is done by means of purse-string and then the catheter carried along the gut for two or three inches in a trough-like groove and the serous coats of the intestine brought together over the catheter. After the jejunostomy has been completed, the obstruction proper may be treated if the patient's condition permits, and if not, the release of the mechanical factors may be done as a second stage.

The opening in the jejunum is carried up to and stitched to the parietal peritoneal and after the obstruction is overcome and the tube removed, the opening closes without danger of fistula or other complications.

The contra-indications are practically nil.

L. D. POWELL.

PEDIATRICS

SUPERVISORS:

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MANAGEMENT OF SUMMER DIARRHEAS IN CHILDREN: Carroll M. Pounders (Arch. of Ped., August, 1924): The annual mortality from the diarrheal diseases in children under two years of age exceeds the combined mortality from measles, scarlet fever, pertussis, typhoid and diphtheria at all ages. Artificial feeding is probably the most important single etiological factor. Less than five per cent of the severe cases occur among breast-fed babies and a fatal case is rare in a baby on the breast. The author's greatest difficulty during the summer months is with fermentative and infectious diarrheas.

Fermentative diarrhea is simply a fermentation of the intestinal contents without any attack on the mucosa or other body tissues by the causative organisms. Infectious diarrhea is a definite bacterial invasion of the intestinal walls and other body tissues by some strain of the bacillus dysenteriae. The condition really should be called bacillary dysentery. In the fermentative type, the abdomen is commonly distended, but there is little pain or tenesmus. In the infectious type, the abdomen is usually flat or sunken. There is often pain and tenesmus and there may be tenderness to pressure along the colon. The character of the stools is different. In the fermentative type, there is usually a green, watery, irritating stool, acid to litmus and showing fermentation. The infectious type of stool is characterized by the presence of pus and blood, very little odor and an alkaline reaction.

The treatment can be discussed under the following headings: (1) initial purgation—that is: oil or magnesia; (2) period of starvation—12 to 24 hours; water freely. This can be given as plain water, barley water or weak tea, preferably barley water, sweetened with saccharin.

Diet: In the fermentative type, the prevalent organisms thrive on a carbohydrate medium. So a food that is high in protein and containing a minimum of fats and carbohydrates is indicated. These requirements are well met by protein milk. It is more readily taken when sweetened with saccharin, using one grain to each quart. The child can be kept on this for some time. When the number of bowel movements approaches the normal, the protein milk can be gradually replaced by boiled skimmed milk. The fats should be withheld for weeks afterwards, as they are very poorly tolerated. In the infectious type, showing blood in the stools, we are dealing with some strain of the dysentery bacillus. Moreover, an excess of carbohydrates tends to inhibit their growth and development. So the indication is distinctly for food composed of carbohydrates and containing very little, if any, fats or proteins. Lactose is the

carbohydrate of choice, as it is slowly broken down and is more apt to reach the lower intestinal tract. It is given in a 7 per cent solution. In from one to five days more, depending upon the amount of improvement, small amounts of boiled skimmed milk are cautiously added. This is carefully raised until it replaces the sugar solution. Cream of wheat can be added quite early.

Toxemia, temperature, dehydration and acidosis: Obviously, the indication is to restore the fluid balance. In mild cases, where there is no vomiting and very little diarrhea, sufficient fluids may be given by mouth. More severe cases are controlled by administering normal saline subcutaneously. But if it becomes necessary to give very much fluid, other than by mouth, the intraperitoneal or intravenous route are more satisfactory.

Drugs play a very small part in the treatment.

R. N. ANDREWS,
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EXPERIENCES WITH LACTIC ACID MILK IN INFANT FEEDING: Morris Gleich (Arch. of Ped., August, 1924). Lactic acid milk, in the absence of breast milk, furnishes an excellent substitute for the routine feeding of well and sick babies. Healthy and sick infants, fed lactic acid milk, have peptic digestion to a certain degree. Acid, then, added to cow's milk renders it favorable to peptic, rennin and lipase digestion.

In the preparation of acid milk the method described by Marriott and Davidson was used. One teaspoon of lactic acid (U.S.P.) is added, drop by drop, to a pint of sweet whole milk, which is previously boiled 5 minutes, the scum removed, and allowed to cool. Two tablespoons of karo syrup are then added. In preparing lactic acid milk, the author suggests that a glass rod be used instead of a spoon and that stirring be very slow. It is advisable to stir about six times to every drop of lactic acid added. A tall vessel seems to give finer curd than a flat pan.

A study of lactic acid milk feeding was made in order to note its value and compare results with other methods. The stools were always soft, yellow and pasty, and had no offensive odor. No mucus or blood was observed. In fact, all children were remarkably free from gastrointestinal disturbances. Abdominal distention, present in three children, caused no apparent discomfort.

The high caloric value of lactic acid milk can be best appreciated by considering a sweet milk formula. If a child of 3 months, weighing 11 pounds, takes 19 ounces sweet whole milk, 11 ounces water and 3 tablespoons dextrimaltose, 5 ounces q3h, it received 500 calories. If that same child is fed 5 ounces lactic acid milk q3h its intake is 840 calories (1 qt. 1 a. m. 600 calories plus karo syrup 4 tablespoons, 240 calories).

Conclusions: Lactic acid milk in infant feeding is no panacea. It has a valuable place in the armamentarium of the pediatrician. Lactic acid milk may probably replace protein milk in the severe diarrheas of infancy. By increasing gastric acidity, it may play an important role in the prevention and treatment of rickets and tetany.

R. N. ANDREWS.

NEW EVIDENCE ON CALCIUM THERAPY IN TUBERCULOSIS: (New York Intravenous Laboratory, 100 West 21st Street, New York).

The value of calcium in tuberculosis has been the subject of much debate. On one hand existed the opinion of the practitioner, based on isolated cases. On the other, and opposed to it, was the academician, who, by animal experiments, was unable to demonstrate the clinical effect claimed by the practitioner. A few clinicians were inclined to believe in the value of calcium, but were unable to demonstrate sufficiently uniform results to enable them to come to definite conclusions as to its value.

This state of knowledge of the value of calcium is not unique in therapeutics. The same condition exists as to the value of other remedies, used empirically and administered by mouth.

A change of opinion as to the value of calcium has been brought about by the intravenous administration. Loeser, in his research work with a number of U. S. P. and standard remedies, ascertained that Calcium Chloride and Calcium Guaiacol Sulphonate, and other calcium salts are adaptable to intravenous administration.

Since the standardization and the commercializing of Loeser's Intravenous Solution of Calcium Chloride, many practitioners and a number of clinicians have proved conclusively that calcium is of great value in tuberculosis. During the last three years an increasing number of articles have appeared in the J. A. M. A. and in other medical journals on the subject. The American Review of Tuberculosis published in their April Number an article on Calcium Chloride in tuberculous enteritis. This is a report of clinical work done in the Fitzsimmons General Hospital, Denver, Colo., and was published by permission of the Surgeon General.

C. A. STEWART.

GYNECOLOGY AND OBSTETRICS

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THE CONTRA-INDICATIONS TO RADIUM IN THE TREATMENT OF DISEASE OF THE FEMALE PELVIS: F. E. Keene (Amer. Jour. of Ob. and Gyn., August, 1924). The author discusses the contra-indications to radium in the treatment of diseases of the pelvis. Except for a few broad statements, this paper is confined to benign lesions.

Two facts stand out in observation on these cases: (1) In properly selected cases the advent of radium marks a great epoch of advance in the realm of gynecological therapeutics. (2) A sharp dividing line exists between the types of cases suitable for radiation or operation.

In dealing with cancer of the cervix early operation supplemented by irradiation is the method of choice. In advanced cases, especially those with extension, it is thought

unwise, as even palliation cannot be hoped for, and irradiation may add suffering to the patient's already miserable condition. What a combination of radium and deep x-ray therapy offers is still an open question. While only early lesions of the cervix are operated upon, operation is employed in fairly advanced fundal carcinomata applying radium ten and fourteen days later.

In discussing the contra-indications to radium in benign lesions, the remarks are limited to cases of myomata and so-called myopathic hemorrhages.

The contra-indications are:

1—*Tumors larger than three months pregnancy.*

Frequently adnexal and intestinal pathology and extensive degenerative changes are found and the already limited blood supply further impaired.

2—*Rapidly growing tumors suggesting sarcoma or actively progressing benign changes.*

3—*Uncomplicated tumors of any size giving rise to symptoms other than abnormal menstruation.*

Symptoms are usually mechanical in origin as a result of traction or pressure and the tumor disappears too slowly to justify radium therapy.

4—*Tumors associated with pelvic pain.*

Operation is preferable here because the pain is usually due to adnexal disease, usually inflammatory; to degeneration within the tumor or to adenomyomata. Radium excites old pelvic inflammatory conditions and degenerative changes or adenomyomata do not respond favorably.

5—*Pedunculated tumors whether subperitoneal or intra-uterine.*

Radium is useless here.

6—*Tumors producing hemorrhage and complicated by demonstrable adnexal pathology.*

7—*The presence of a marked secondary anemia in association with tumors not giving rise to sufficient uterine bleeding to account for the anemia.*

In the three cases observed necrosis of the tumor was found and rapid disappearance of the anemia post-operative.

8—*Tumors in young women.*

Radium sufficient to cause disappearance of the tumor may bring on a menopause and sterility. Doses are justifiable and sometimes beneficial in myopathic hemorrhages.

9—*Tumors so distorting the uterine cavity that introduction of radium well above the internal os is impossible.*

Sufficient radiation of the uterus is impossible and subsequent contraction of the internal os may give rise to hematomata or pyometra. Furthermore, a diagnostic D & C is indicated to rule out an area of malignancy.

10—*Where differentiation between myomata and adnexal pathology cannot be definitely determined.*

11—*Myomata or myopathic hemorrhage in nervous women.* Menopausal symptoms are probably more acute following irradiation, if they develop, and it is very likely to be the case in nervous women.

12—*In cases of radiophobia.*

F. A. BOTHE.

ROENTGENOLOGY

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EFFECT ON THE BLOOD OF IRRADIATION: Minot and Spirrling (Am. Jour. Med. Sci., Aug., 1924). An unusually complete review of the literature is presented together with the results of blood studies on 42 cases of malignant disease receiving various doses of roentgen rays. The effects of both deep and superficial therapy are presented and compared.

The most important findings are:

1. The first effect of radiation is a transient increase of neutrophiles. Following this a leukopenia and lymphopenia develop, the count going below 5,000 frequently about 6 days after intensive therapy. Bone marrow depression is present at this time.

2. The character of the reaction following the newer deep therapy is the same as that following more superficial doses, but it comes on more rapidly, is more intense, and more persistent.

3. Eosinophilia, degenerated leucocytes, and an increase of immature leucocytes appear frequently. Platelets are only slightly affected while there are no important changes in the red corpuscles or the hemoglobin.

4. The clinical condition of the patient is much less

important in producing the reaction than the character of the dose. The amount of surface area radiated is of great importance in determining the amount of blood changes which will take place.

5. Although a moderate depression of activity of lymphatic tissue and bone marrow do not have any serious detrimental effects, care should be exercised to determine the degree of leukopenia before radiation and where a study of the formed elements of the blood indicates a severe marrow depression it may be well to consider whether the benefits to be derived from further radiation will offset the disadvantages of increased hemopoietic depression.

LEO G. RIGLER.

MASSIVE COLLAPSE OF THE LUNG: Holmes (Am. Jour. Roent., June, 1924). The most important roentgen findings are as follows:

1. Displacement of heart and mediastinum to the affected side together with a high rigid diaphragm. This may occur in chronic fibrosis of the lung, but the appearance of the affected lung should indicate the diagnosis.

2. Lung in affected area gives a gray mottled shadow with loss of outline of the diaphragm if the lower lobe is involved.

3. The findings simulate collapse of the lung from other causes and the history is necessary to make the definite diagnosis.

Four cases of massive collapse following operation are reported with roentgenograms at different stages of the condition.

LEO G. RIGLER.

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MINNESOTA MEDICINE

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ORIGINAL ARTICLES

THE BEHAVIOR OF THE TESTIS UNDER VARYING EXPERIMENTAL CONDITIONS AND THE FUNCTION OF THE SCROTUM; TRANSPLANTATION, CRYPTORCHIDISM, VASECTOMY*†

CARL R. MOORE, Ph.D.
Chicago

In the department of Zoology at the University of Chicago we have been engaged for the past six or seven years on a relatively intensive program of sex research. This has been to a large extent an outgrowth of the beautiful work of Prof. F. R. Lillie, chairman of the department, who demonstrated that fetal hormones have a remarkable capacity of influencing the sexual development of a growing fetus. This work, done on the developing twins of cattle, showed that a male-female combination resulted in the male delivering certain substances that not only prevents the proper development of the reproductive system of the female but even influences its development in a remarkable manner towards the male type. Our procedures have been directed toward an analysis of the primary question of sex and my own part of it has been directed to a biological study of the sex glands. Today I shall touch upon but one of the many sides of the work—namely some of the biological aspects of the mammalian testis. Presented largely from the biological aspect I will purposely leave to you for the most part the clinical applications that underlie and run through the work.

TESTIS GRAFTS

Probably the best known work in this field comes from the laboratories of Steinach in Vienna,

†From the Hull Zoological Laboratories, the University of Chicago.

*Presented before the Minnesota State Medical Convention, St. Cloud, Minn., Oct. 10, 1924. References to authors quoted and some details here omitted will be found in a paper of similar character in the *Journal of Endocrinology*, vol. 8, No. 4, 1924.

Sand at Copenhagen, and Lipschutz at Dorpat. Briefly, the typical testis graft—a whole or a part of a testis transplanted from one individual to another and recovered some months later—is somewhat different from normal testis tissue (Fig. 1). The seminiferous tubules are characteristically devoid of a germinal epithelium and though well outlined, but considerably smaller in diameter than normal tubules, contain but a single layer of cells next the basement membrane; these cells are ordinarily thought to be sertoli cells. The seminiferous tubules, unlike those of normal testes, are widely separated from each other, the intervals being packed with interstitial tissue. It is the latter tissue that is usually considered to be the internal secretory tissue of the gland.

Personally I have obtained many grafts from the rat and guinea-pig transplantations resembling

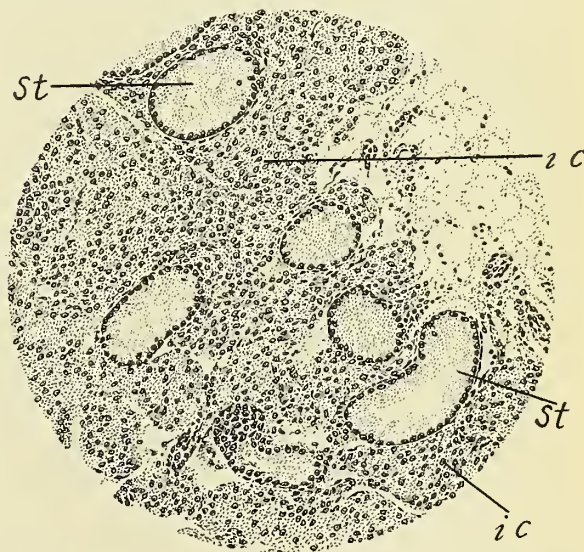


Fig. 1. Part of cross section of testis graft from female guinea-pig, seven months after transplantation, *ic*, interstitial tissue; *st*, degenerate seminiferous tubule.

this grade of graft but it has been the unusual type that has been of most importance from the fact that it presents conditions to be accounted for and has thus stimulated further work.

It should be mentioned that testis grafts have

been recovered from transplantations into normal males, castrated males, normal females, spayed females, and females that have given birth to normal litters of young while carrying the testis graft; these have been recovered from thirty days to approximately one year after transplantation. It is perhaps known to many of you that a considerable amount of Steinach's work and theories postulate an antagonism between the sex hormones derived from the ovary and testis. He has emphatically stated many times that this antagonism is of such a nature that one sex gland will not grow or persist in the presence of the other. My own work is in entire disagreement with this idea and I have produced artificial hermaphrodites, experimentally, so that a functional female would carry a testis graft or a functional male carry an ovarian graft that was actively maturing new follicles. It is also known that human material presents occasionally a fair degree of typical hermaphroditic glands that have persisted for long periods of time.

But this unusual type of graft I have obtained demands our attention. Instead of degenerate, quiescent seminiferous tubules and a great interstitial cell hypertrophy, some of them have contained seminiferous tubules in an active stage of spermatogenesis with normal amounts of interstitial tissue (Fig. 2). The sex cells have continued to multiply, building up an epithelium of two to three cells in thickness, but the innermost cells fail to adhere to those being produced underneath, and become loosened from the epithelium, escape into the lumen of the tubules, and degenerate. It is a curious fact that out of the hundreds and literally thousands of testis grafts that have been studied from mammals no one has ever found a graft in which complete germ cell differentiation has taken place, whether the graft was made subcutaneously, intra-muscularly or intra-peritoneally. It has been a problem since the first graft was studied to account for the complete absence of spermatozoa; active multiplication of these germinal cells goes on but none ever reach the final stage of the flagellate spermatozoon. One of our problems has been to determine why it is so.

Our first step in advance in obtaining real information on this question came through a study of experimental cryptorchidism. It is common knowledge that man and many other mammals (pig, horse, sheep, etc.) occasionally experience a

retention of one or both testes in the abdominal cavity; one in 500 military recruits according to Dr. Bevan of Chicago. One or both testes fail to descend into the scrotum through the inguinal canal and since hidden from view are known as "cryptorchid testes." Many such have been described and they are invariably abnormal and functionless so far as sperm production is concerned; doubly cryptorchid men or animals are sterile. The seminiferous tubules are without an epithelium similar to the ordinary testis graft.

It has usually been assumed that the condition of these undescended testes was due to an improper embryological formation but that this is wrong I will show unmistakably.

The guinea-pig, rat, rabbit, and some other mammals retain throughout life a wide open connection between the scrotum and the peritoneal cavity, and the testes may be elevated through the

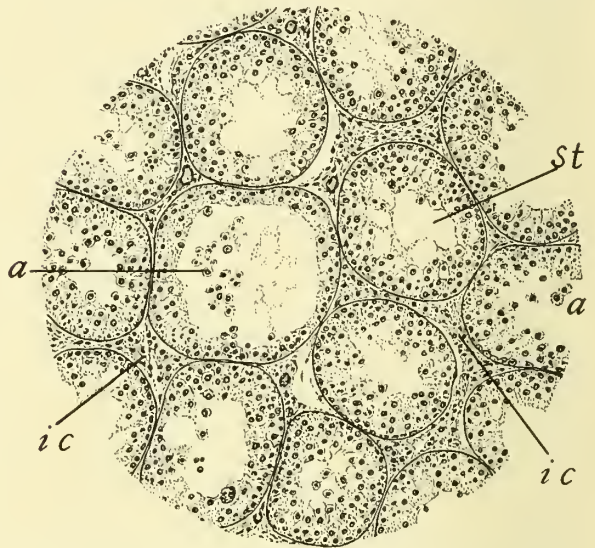


Fig. 2. Part of section of testis graft from female guinea-pig nine months after transplantation. *a*, cells of germinal epithelium free in tubular lumen; *ic*, interstitial tissue; *st*, seminiferous tubule with many cells in germinal epithelium.

open inguinal canals into the abdominal cavity, to redescend into the scrotum on relaxation of the controlling muscles. Under these conditions the testes are normal. If, however, the testes are pushed through the open inguinal canals into the peritoneal cavity and are prevented from returning to the scrotum a very rapid and striking, progressive degeneration of the generative portion follows. Forcible retention may be accomplished by several slightly different means, i. e., by severing the mesenterial connection between the epididymis

and the bottom of the scrotum and turning the testis back into the peritoneal cavity; by pushing the testis through the canals and tying the scrotum, or sewing shut the inguinal canals, etc. Under such conditions the blood supply, nerve connections and vas deferens are normal. More certainly will the testis be retained in the abdomen if the inguinal canals are closed with a purse string suture, but in approximately 50 per cent of the cases in the guinea-pig the testes do not redescend into the scrotum when the canals remain open, even though the testes are not fastened by sutures.

It makes little difference what means are taken to insure abdominal retention of the elevated testis, the results are the same if the organ does not sag into the inguinal canal. The germinal epithelium of a normal active testis retained for the short period of seven days in the abdomen will be found to be totally disorganized. The usually well defined tubular lumen will be practically filled with a mass of free cells thrown out from the epithelium; many cells may appear approximately normal but the majority are in a stage of degeneration. Some of the cells can be defined in outline only, others show fragmentation of the nucleus, and chromatin materials scattered throughout the cell or protoplasmic masses may be located in a granular debris, the result of more extensive degeneration. The former compact epithelium is little in evidence, its place having been taken by a fibrillar reticulum filled with vacuoles or spaces from which the cells have escaped or in which they have undergone fragmentation and dissolution, with or without the complete removal of the fragmented remains. Very often large multinuclear protoplasmic masses—typical “giant cell” like masses—are to be found either in the epithelial position or loose in the lumen. All stages in the formation of these multinucleate masses can be followed and they are seen to owe their origin to the coalescence of contiguous germinal cells; the cell walls disappear and the epithelium reminds one of the proverbial melting pot in which discrete cells are merged into a common protoplasmic mass.

By fourteen days peritoneal retention the majority of the degenerating debris has been removed from the tubules through liquefaction and transportation and but few cells can be seen; these are almost without exception in a degenerate condition. By twenty days little else remains in the tu-

bules, aside from the reticulum, than the Sertoli cells situated against the inner border of the basement membrane, and a few spermatogonia. We have, therefore, produced experimentally, within twenty days, a typical cryptorchid testis such as occurs in nature.

So long as the testis remains in the peritoneal cavity it is degenerate. (See Fig. 3.) Followed at brief intervals from seven days to more than a year after operation, the testes are found to progressively decrease in size; tubules shrink to one-third their original diameter and interstitial cells become more prominent and are collected in masses between the now more widely separated tubules. If by chance the testis returns to the scrotum after being elevated into the peritoneal cavity it may be found a few months later in a normal condition. If descent has been only partial, and the testis is held by adhesions from taking its normal scrotal position, then the testis may be in part normal, part degenerate. In general it may be stated that the more nearly a testis returns to its normal scrotal position the more nearly normal will be the seminiferous tubule epithelium.

To test the powers of recuperation of a testis after degeneration, both testes of an animal were elevated to the peritoneal cavity and so retained for

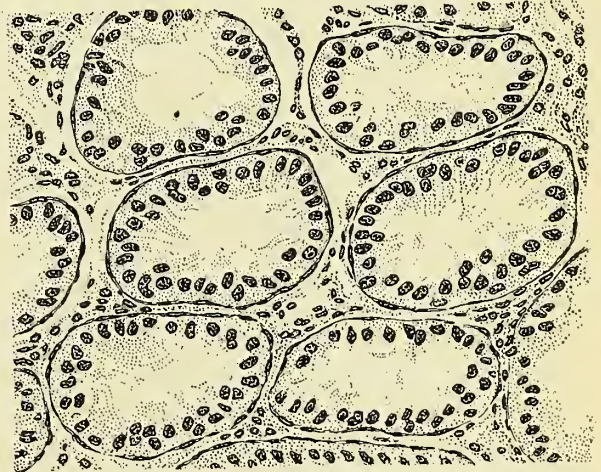


Fig. 3. Seminiferous tubules from testis of adult sheep retained in abdominal cavity for 76 days. Germinal epithelium has been removed and Sertoli cells remain in the tubules.

twenty-four days. By a second operation one testis was replaced in the scrotum, the opposite one removed and studied histologically to ascertain the stage of degeneration of the one in the scrotum. The seminiferous tubules, at the end of twenty-four days are empty of all degenerating re-

mains, and Sertoli cells with a small number of spermatogonia formed a single layer of cells against the walls of the basement membrane.

It can be realized, therefore, that the testis replaced in the scrotum, after its twenty-four days retention in the abdomen, was in a highly degenerate condition. It was allowed to remain in the scrotum for two and a half months when the animal was killed and the testis prepared for histological study. The replaced testis had almost completely recovered from its degenerate condition. The majority of the tubules contained a well established epithelium and in many of them spermatozoa had again appeared. A few tubules were in stages of partial recovery but some were entirely devoid of an epithelium. In the latter case it is questionable if recovery would have ever taken place and there is little doubt that all cells capable of further division were destroyed during the peritoneal confinement. The few totally degenerate tubules were located indiscriminately among normal tubules and not segregated off into any particular locality, thus showing that recovery has no definite relation to particular local conditions within the gonad but depends upon the presence of cells capable of further division at the time of scrotal replacement.

It follows, therefore, that the scrotum exerts a peculiarly striking influence upon the testis and an influence that is necessary not only for the complete differentiation of germ cells but even for the retention of cells previously differentiated. Removed from the scrotum, or from conditions simulating those of the scrotum, a testis is rapidly deprived of its germinal epithelium.

Is this not a partial solution for the absence of normal tubules containing spermatozoa in testis grafts? With a realization that the testis-scrotal relationship was necessary for the production of spermatozoa I transplanted testes into the scrotum by sewing them to the walls of the tunica vaginalis. Though the tunica vaginalis would seem a rather poor place for the development of the necessary vascularity for a graft to persist, nevertheless the transplantations were successful and grafts have been recovered six months after transplantation that contained normal seminiferous tubules with typical spermatozoa. Thus for the first time have testis grafts from mammals been obtained that contained normal seminiferous tubules. We have additional evidence in this result that the scrotum is

necessary for germ cell differentiation in those mammals that normally possess a scrotum.

THE STEINACH OPERATION

Looking at the problem of the biology of the sex gland from another angle the popularly known and, if you will pardon an academic opinion, the too frequently practiced Steinach operation has come in for considerable attention in our laboratory. This problem of vasectomy or vasotomy has been a battleground of opinions for more than fifty years. It involves the effect upon the testis of occluding the vas or ductus deferens, the outlet duct of the testis. Opinions have been about equally divided that such an operation causes the generative part of the testis to atrophy and the supposed internal secretory part to undergo an increase, and that it leaves the testis normal. The French writers, Bouin and Ancel, who are really the founders of the conception that testicular hormones are the products of the interstitial cells, gave this problem its initial impetus, and following the recent work of Steinach the debatable condition has in the last few years been elevated to the position of one of the twentieth century miracles. It is at once a means to rejuvenate a worn-out organism and restore its youthful qualities, to enhance a pugnacious temperament, cure failing eyesight, headaches, heart-failure, and regulate blood pressure—truly a phenomenal series of results from such a simple procedure as the ligation of the excurrent duct of the sex gland.

Let me make my position clear that clinical symptoms have played no part in my results, since it is sometimes difficult to adequately determine the feelings of a rat or guinea-pig. It is also too well known that with a certain class of people in the proper mental conditions the mere acquaintance with the mysteries of an ether anesthesia works wonders untold. My own interests in the problem have been purely biologic and my first operations in 1919 were done to study the testis reactions and not to disprove the contentions of other workers.

The previously described results, and the philosophy accompanying the same, in brief, is that occlusion of the ductus deferens causes a rapid degeneration of the germinal epithelium accompanied by an increased amount of interstitial cells. These interstitial cells are therefore supposed to furnish an overabundance of internal secretions or

hormones, and these substances are the effective and sought-after results of the operation. This reaction is the only morphological evidence upon which the end results are based and upon the behavior of the tissue must stand or fall the value of the operation.

I could dismiss the results with a word were it not essential to attempt to harmonize the very divergent results obtained after the operation, and to attempt an explanation of the primary misconception.

I have performed the experiment on rats, guinea-pigs, rabbits and sheep and the results are consistent in showing that the operation leaves the testis in a normal, functional condition, actively producing germ cells, provided that it retains its normal position in the scrotum. Since the rabbit has been used to a great extent for such operations let me review, very briefly, the series of experiments brought to a close late in the past summer. It has been maintained that degeneration in the testis after vas deferens occlusion occurs from two to three weeks after operation.

Mr. Quick and I did twenty operations and studied the testes carefully at two weeks, one, two, three, four, five, and six months later. We found that the generative portion shows absolutely no reaction to the operation but the testis continues to produce germ cells. Not in a single case in all my vasectomy operations, on any of the four groups of animals, has there ever occurred an interstitial cell hypertrophy. And kindly remember, please, that it was only on the basis of such an hypertrophy that the idea was ever conceived. In the rabbit six months after vasectomy the testes have been found to be actively producing germ cells. In fact the intensity with which this proceeds even causes the epididymis to increase in size in order to accommodate the testis products.

Is it possible, from what we now know, to account for these findings of Bouin and Ancel, Steinach, Sand, and others?

I believe that many of the positive findings, for instance the degeneration which took place in the testis after vas ligation, can be explained on the basis of an abnormal testis-scrotal relationship. Following the operation on animals with open inguinal canals adhesions often cause the testis to be partially or completely drawn into the abdomen. Dr. Oslund, working in our laboratory on rats and guinea-pigs, performed something like 75 opera-

tions very diversified as to the time the testes were allowed to remain in the animal after operation. Many of these testes were degenerate, but in every case this degeneration was correlated with an abnormal relationship of the testis to the scrotum. If this organ is displaced towards the abdominal cavity we can only expect degeneration—but this is not caused by the vas deferens having been occluded.

In an adult rabbit I purposely displaced one testis and fastened it in an abnormal position with relation to the scrotum but left the vas deferens alone, whereas its partner remained normal with relation to the scrotum but had the vas deferens ligated and cut in two parts between ligatures. After two weeks the vasectomized testis was perfectly normal but the displaced one was highly degenerate; it must be remembered that in this instance, where the vas deferens was normal, degeneration was marked. This shows the misleading possibilities had the vas deferens in both cases been ligated.

When the epididymis, located for the most part at the bottom of the scrotal sac, increases so greatly in size after vas ligation, it pushes the testis upward into the inguinal canal or indeed through the canal into the abdomen. We have obtained degeneration in such cases, as is to be expected, but again it is not due to vas occlusion.

May I emphasize, therefore, that on the most carefully conducted type of operation, I can find no biological justification for the ideas underlying the Steinach operation.

Here again, however, we have re-emphasized the importance of the normal testis-scrotal relationship. A testis displaced from the scrotal influence rapidly undergoes degeneration, whereas its partner residing in its normal position remains healthy and active. What is this mysterious relationship that exists between testis and scrotum?

A few years ago I set about to attempt an answer to this question, and eliminated by experiment every possibility occurring to me but one and stated in 1922 that it appeared to be a temperature factor—a differential temperature between the body and scrotum. While working upon experiments to prove or disprove the hypothesis I came across a paper from the laboratories at the University of Edinburgh by F. A. E. Crew, who offered the suggestion on purely hypothetical grounds that a differential body temperature might account

for the structural condition of undescended testes.

Now if it is a differential temperature factor that is the underlying cause of degeneration several corollaries should follow. In the first place the temperature within the scrotum should be lower than that within the abdomen, and in such a case it would be recognized that the scrotum was a local temperature regulator for the testes. Then, could we prevent the scrotum from functioning in this regulatory capacity, the testes should show degeneration without displacement from the scrotum. This latter possibility was tested first.

SCROTAL INSULATION

With the cooperation of Dr. Oslund, the scrotum of a ram was insulated against loss of heat by securely, though loosely, encasing it in woolen materials and a water-proof covering, sewed to fit the scrotal contour, and suspended sufficiently by arti-

retained testes, while many tubules lacked entirely the germinal epithelium (Fig. 4). *The animal had sterilized itself with its own body heat due to prevention of the local thermo-regulatory function of the scrotum.*

SCROTAL TEMPERATURE AND BODY TEMPERATURE

With Mr. W. J. Quick, temperature readings were made with ordinary thermometers passed into the abdomen through locally anesthetized abdominal regions of rats, rabbits, and guinea-pigs. One thermometer bulb in the peritoneal cavity and another passed through the open inguinal canal into the scrotum, alongside the testis, showed us that at the same moment the scrotal temperature was appreciably lower than that in the peritoneal cavity in all cases. The differences between the two cavities varied as the external environmental temperature varied (Figs. 5 and 6). Thus in a white rat observed in a room temperature of 16° C. the scrotal temperature was 8° C. lower than that of the peritoneal cavity. This gives absolute proof, therefore, that the normal environmental temperature of the testes is appreciably lower than the general body temperature.

There remained for disposal one further assumption to provide actual proof of the correctness of our working hypothesis, namely, the testis should undergo degeneration following the application of temperatures slightly higher than those normal for it.

EFFECTS OF HEAT

It was found that hot water pads applied to the external surface of the guinea-pig scrotum, raising the temperature approximately 6° to 7° C. above normal body temperature for a period of fifteen minutes resulted in severe tubular degeneration within ten days after application. Increasing or decreasing either the length of application or the degree of temperature applied we can produce at will any stage of degeneration desired from the destruction of a few peripheral tubules to complete degeneration of all seminiferous tubules in the testis. Direct submergence of the testis in a controlled saline bath of 47° C. for five minutes is sufficient to produce complete degeneration of every tubule of a guinea-pig testis within five days after the application. Thus the application of slightly higher than its normal temperature is shown to be fatal to the generative portion of the testis and the degeneration following such an application is very

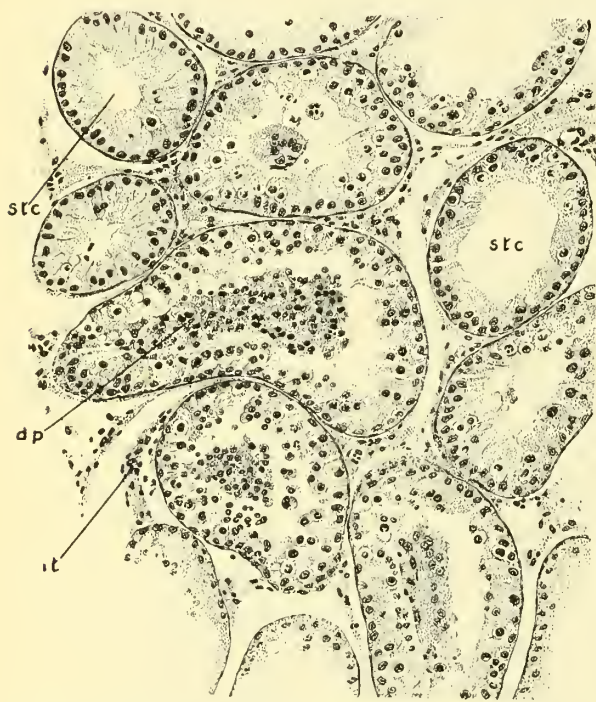


Fig. 4. Portion of testis of adult sheep 80 days after scrotal insulation (no other operation). *dp*, tubule in stage of degeneration with debris of former germinal epithelium in lumen; *it*, interstitial tissue; *stc*, seminiferous tubules devoid of germinal epithelium.

ficial supports as to preclude binding the scrotum or producing abnormal pressure. Within eighty days the testes were found to be devoid of spermatozoa; many tubules were in advanced stages of degeneration, the tubules being filled with loosened, degenerating cells similar to peritoneally

similar to the type occurring after testis elevation into the peritoneal cavity.

The totally independent work of Fukui, a Japanese investigator, but recently published, arrives

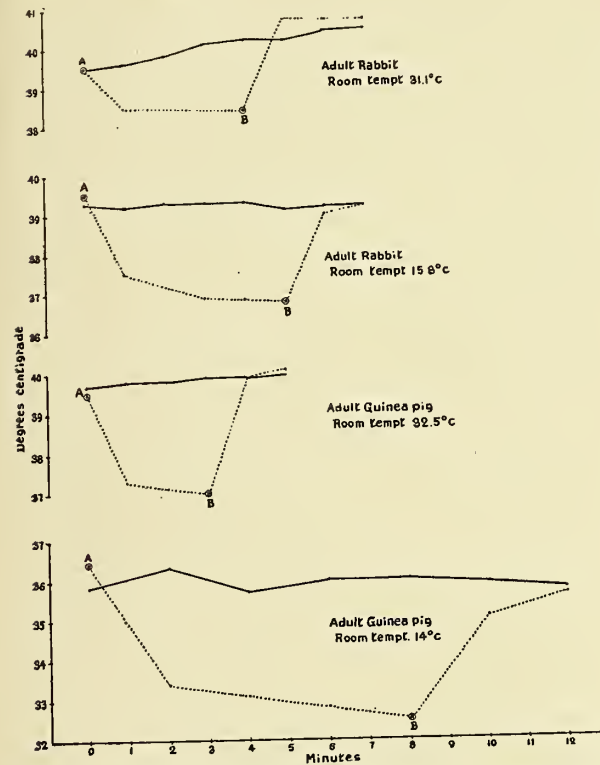


Fig. 5. Graphs showing temperature of abdominal cavity in comparison with temperature of scrotum in the rabbit and guinea-pig, at different room temperatures. In each case (Fig. 6 also) the abdominal cavity temperature is indicated by a solid line. At point A, one thermometer pushed into scrotum alongside testis; decline in temperature indicated by dotted line. At point B, scrotal thermometer retracted into abdomen; temperature curve ascends.

at a similar interpretation with respect to the effects of temperature on the testis and the explanation of degeneration of testes elevated into the body cavity. Applying heat in the form of hot water, hot air, heat of the sun, and arc light heat, Fukui has worked out a so-called "heat curve" of the testis in relation to time of application and degree of temperature employed. A very striking observation, however, and one that greatly strengthens our proof of degenerate testes when elevated into the body cavity was made as follows: Fukui elevated both testes of an animal into the peritoneal cavity but artificially cooled the external area on one side in the region of the elevated testis. He found that in the course of a few days the testis in the artificially cooled area was normal, whereas the uncooled testis was highly degenerate. Thus with all

the accumulated evidence there should no longer be any doubt that our conception of the effects of the body temperature on the testis condition is the correct one.

Let us examine briefly, then, the qualifications of the scrotum as a local thermo-regulator for the testes. In its simple form in the rodent the scrotal sac is but an outpouching of the peritoneal cavity posteriorly underneath an area of skin much thinner than ordinary skin, and well provided with sweat glands; the muscular layers are exceedingly

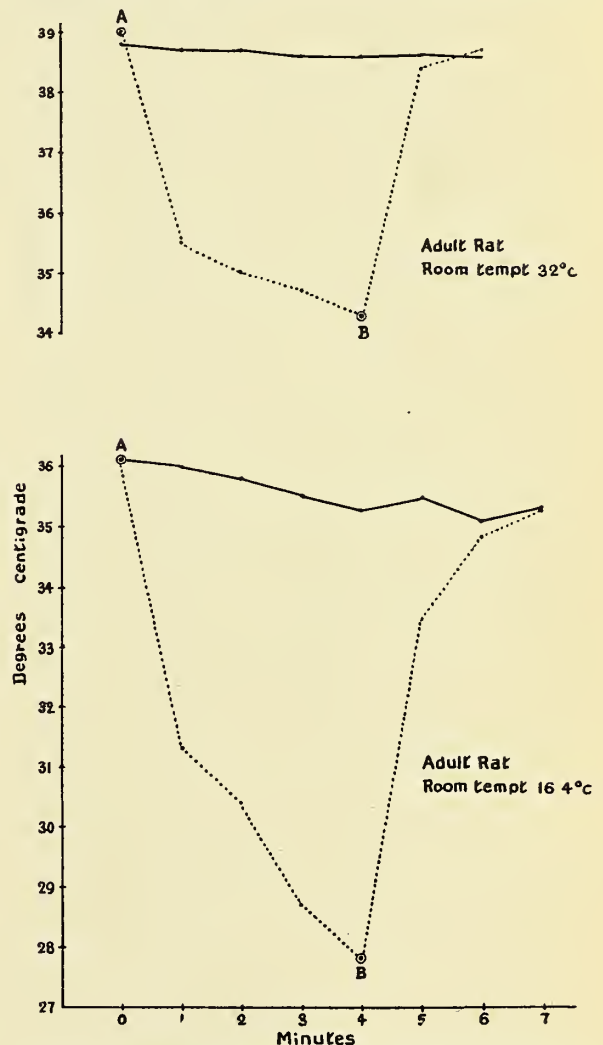


Fig. 6. Graphs showing abdominal cavity temperature in comparison with scrotal temperature in the white rat, at different room temperatures. Procedures and temperature changes indicated as in Fig. 5.

thin; subcutaneous fat is absent, and the organ varies in size and shape as environmental temperatures vary. Thus on hot days the scrotum relaxes to its full pendent condition, permitting the testes

to be farther removed from the body, whereas in a cold atmosphere the scrotum is contracted bringing the testes nearer to the body. It is difficult to detect a male from a female rat in low temperatures without close scrutiny, as the testes may be so elevated on scrotal contraction that their position is in reality abdominal; on hot days, however, the testes protrude considerably in a post-anal position. A similar adjustment follows also for man.

The physical and physiological principles of a local temperature regulator are inherent in the mechanism, and in consideration of all proofs brought forward I have no hesitancy in stating that *the scrotum of mammals is now to be considered a local thermo-regulator for the testes and that the regulatory or functional capacities are indispensable for the production of differentiated germ cells or the maintenance of those already produced.* Not longer than three years ago Cunningham, in his book, *Hormones and Heredity*, stated that "Various causes have been suggested for the formation of the scrotum, but no one has ever been able to suggest a use for it" (page 147). I believe we have not only been able to suggest a use for it but have proved its function and utility.

Objections may be raised against the idea, however, due first to the lack of such a structure in the bird, where the testes are abdominal and the body temperatures even higher than that of the mammal; and second to the lack of it in some mammals (monotremes, elephant, many aquatic forms, bats, etc.). In regard to the first objection may I not state that the bird and mammal are two entirely different animals. Many structural and physico-chemical differences exist between these two forms. Because the testicular tissue is a decidedly heat labile substance in one is no good reason for assuming it in the other; slight physico-chemical differences may produce an entirely different reaction system, and we need not be troubled by such physiological differences, particularly when we appreciate the many structural differences between the two animals. As regards the mammal it need only be mentioned that most biologists now assume that an evolution of animal forms has occurred within the class mammalia as well as among vertebrates as a whole, or invertebrates. In the monotremes, the lower reptile-like mammals in which it is said body temperatures are by no means constant but are subject to wide variations, the testes are

located in the reptilian position, namely, just posterior to the kidneys in the abdomen. As we ascend the scale of mammals a typical scrotum is gradually produced. In some mammals (bat, sloth, etc.) the testes have descended into the pelvic region and have taken up a position against the anterior abdominal wall in a pouch-like depression over which the skin is very thin. It is unquestioned that sufficient temperature adjustment is thus obtained, else we would not have such animals preserved for our edification. In rodents an onward step has been made; the testes protrude into the outpouching of the peritoneum in the inguinal region but the final scrotal condition has not yet been accomplished, as the sacs present a wide open connection capable of permitting passage of the testis into and out of the abdomen. The final closed scrotum is only gained in the higher mammals. It should not trouble us exceedingly that variations have occurred during its evolution—adaptations perhaps—for such have been present even in the evolution of such typical structures as appendages.

We may therefore assume a gradual evolution of a scrotum within the mammal group and may we not, with all justice, consider that perhaps the evolution of the entire mammalian group may have been more or less dependent upon this scrotal evolution? It involves certainly the capacity of the reproductive system to function and therefore the very foundation of the race.

In this general conception, therefore, we have brought together under one fundamental principle an explanation of the behavior of the testis in transplantation, an explanation of the condition of the cryptorchid testis, and I believe we have some insight into the divergent results and misconceptions of vasectomy, and finally the establishment, for the first time, of a proper conception of what has been heretofore considered an apparently useless and even detrimental structure—the scrotum. The established general physiological principles of the testis gives us not only a foothold in the upward climb into an understanding of the biology of this sex gland but it also brings to light some facts that may modify previous surgical procedures.

DISCUSSION

DR. F. C. RODDA (Minneapolis): I would like to ask in regard to the use of heliotherapy, in exposing the patients to the sun's rays, in which there might be a very consider-

able elevation of temperature, would there be any element of danger?

DR. CARL R. MOORE (Chicago): The only way I can answer that is to cite a case of the human testis examined after the application of heat. I believe that melted paraffin has been used by some to reduce inflammations in cases where epididymitis has occurred. One case has been cited where examination showed that the testicle had degenerated; there are always possibilities of a recovery if degeneration is not too severe. Bearing on the same situation, when the testicle is elevated into the abdomen, we know it can almost completely degenerate and still come back to normal. There is nothing to make us believe that the sensitivity of the guinea-pig testis to heat is of the same order as that in the case of the human. It may be possible that the human testis will stand more heat without degeneration; we do not know. But there is not a question of doubt in my mind that extraneous application of heat for too long a time, or for a shorter time and a higher degree of heat, will produce exactly the same type of degeneration in the case of the human testis.

DR. C. N. HENSEL (St. Paul): What about the question of leaving the undescended testicle in the abdominal cavity or in place in the scrotum?

DR. MOORE: Personally, I have had no experience in this matter, but Dr. Bevan I believe has discussed the question (see *Surg. Clin.*, Chicago, 1918, p. 1101-1117). He reports operations on approximately five hundred cases of return of the testes to the scrotum. Of course up to that time the possibilities of recovery were not known. It was not clearly understood that the displacement was the condition which caused the degeneration, and therefore the recovery of this has not been followed excepting in a few cases. Dr. Bevan stated to me personally that he was very certain that reestablishment of the functional activity on return to the scrotum had followed in cases in which the individuals were very young. We do not know how long it may remain in this abnormal position and still be able to return to its functional condition. Dr. Bevan I think under ordinary conditions advises return. He himself has done a great many operations of that character.

THE CHAIRMAN: We are greatly indebted to Dr. Moore for coming this long distance and giving us this very excellent review of his work. It is this sort of thing that we need and we are carrying home something from this meeting with which to meet a good many of the questions that concern many folks, even those who do not reside in Minnesota.

VITAMIN CONTENT OF COD LIVER OIL HIGH

A teaspoonful of cod liver oil contains as much of the fat soluble vitamin as a pound of the best butter, says *Hygeia*, popular health magazine published by the American Medical Association.

That is the reason why cod liver oil is given babies that have a tendency to rickets. As far as calories are concerned, cod liver oil has about the same value as other pure fats, but its vitamin content is far greater than the same quantity of butter, cream or other fatty articles of diet.

THE DIAGNOSIS AND TREATMENT OF NEPHRITIS IN CHILDREN*

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Nephritis in infancy and childhood differs decidedly and in many ways from that occurring in the adult.

The youth and vigor of its tissues is in the child's favor in this condition as compared with the adult. Its cardiovascular system is generally in good order and has not been hopelessly weakened or damaged by abnormal influences as is so commonly the case in the adult. If the blood pressure does rise, it has little or no effect on the vascular system of the child. Fundamental differences like these, depending largely on the age of the organism, determine to a great extent the types commonly observed and also the prognosis of the condition—the latter always favorable in the child, but quite the other way in the adult.

The cardio-renal type of nephritis, which is without doubt the most common type observed in the adult, is rarely seen in the child—and again the acute hemorrhagic nephritis so commonly seen in childhood is only seldom seen in the adult.

There are essentially four types of nephritis of childhood which the practitioner will regularly and frequently encounter and which he must learn to recognize and differentiate: two acute types, the acute hemorrhagic nephritis and the acute exudative tubular nephritis or nephrosis type; and two chronic types, the mild so-called "pedo-nephritis" of Heubner and the more severe chronic nephritis with contracted kidney and hypertension. More elaborate classifications are often attempted and suggested, but it will be found that the additional types mentioned or included are really only sub-acute or intermediary stages of one of the four types mentioned above.

Acute hemorrhagic nephritis is the most common form of nephritis seen in infancy and childhood. Practically all observers agree that every type of nephritis depends for its development upon some source of infection. They are surely unanimous upon this point in the case of the acute hemorrhagic type. In my experience, infections in

*Presented before the Northern Minnesota Medical Association meeting, Duluth, August 4, 1924.

and about the throat—such as tonsillitis and acute adenitis, especially of streptococcic origin—are the most frequent and common cause. The acute hemorrhagic nephritis following scarlet fever is a familiar picture in the experience of every practitioner. It is always a streptococcic infection. Severe impetiginous skin infections very easily cause acute hemorrhagic nephritis. One should never fail to look for it as a complication of this condition. Gastro-intestinal diseases are a less frequent cause except in the very young artificially fed infant. Pyelo-cystitis, appendicitis, and infections about the teeth are among the rare causes.

In acute hemorrhagic nephritis the glomeruli of the kidney are the chief seat of inflammation. The principal characteristic of the condition is the bloody urine. The urine contains a moderate amount of albumin, quite a number of pus cells, but very few casts. Ordinarily there is very little or no edema present in the case. The kidney takes care of fluid very well. The urinary secretion is generally adequate. Functional tests of the kidney may show a moderate diminution of kidney functional capacity. There is in this type very little tendency to uremia. The heart and blood pressure are normal. The child really does not seem very ill. The tendency is always to recovery in this type. Fatal outcome in the acute stage is rare. Occasionally a case merges into the chronic form.

The second acute type, the nephrosis or exudative tubular nephritis, presents an entirely different picture.

The seat of the dysfunction is not in the glomeruli, but rather in the tubular portion of the kidney. There is swelling and degeneration of the cells lining the renal tubules. These cells are cast off, appearing in the urine as casts. The permeability of the kidney for proteins of the blood is increased. This causes albumin to appear in the urine. The glomeruli are not in any way involved and there is no formation of interstitial fibrous tissue as in contracted kidney. The changes in the kidney are not permanent. These cases can completely recover.

There is a different train of symptoms in this type from that of the acute hemorrhagic. This type of nephritis is also the result of infection. The infection is focal—often quite obscure, but Marriott and Clausen have shown that it can almost invariably be demonstrated in the nasal accessory sinuses. The staphylococcus is most com-

monly present in the lesions found there. The toxic material originating from these lesions is, in the opinion of Marriott and Clausen, the factor responsible for the development of the symptoms in this condition.

The nephritis begins without apparent cause—out of a clear sky while the child seemingly is in good health. There is no temperature and rarely the least evidence of any accompanying disease. The earliest symptom of the disease is edema. Beginning in the legs and then the face or in both places simultaneously, it spreads rapidly to the rest of the body. The edema is very persistent and continually recurs after slight remissions. The amount of edema present is an index of the severity of the case.

In the mild type the urinary output is slightly diminished. Albumin is present. There are a few red and white blood cells and a large number of cellular and granular casts. The heart is normal but there may be slight elevation of blood pressure. Functional tests of the kidney are somewhat diminished. The patient tends to recover from this condition and complete repair of the kidney can take place.

The severe cases present more the picture of adult parenchymatous nephritis. The edema is excessive. There is marked suppression of urine. Often only 2 or 3 ounces of urine are passed during the twenty-four hours. This oliguria often gives way to marked polyuria. There is a great deal of albumin, more blood than in the mild type and large numbers of cellular and granular casts. The blood pressure is generally high. The kidney is unable to excrete salt. This is always true if excessive edema is present. Non-protein nitrogen and urea retention may be high; but generally there is no real retention. The occurrence of uremic symptoms is an ever-present possibility and often does occur; but one must be careful not to mistake an edema of the brain for uremia. The patient may recover entirely without the development of chronic forms of nephritis. This development does, however, not infrequently occur; and the case is much more apt to end fatally at any stage than the acute hemorrhagic form. Marriott and Clausen advance an interesting explanation for the occurrence of the edema. It does not occur because the kidney fails to excrete fluids or salts. They believe that it is the result of change in the permeability of vessels and cells throughout the

body. This permits fluids and salts to pass through vessel walls into cells and serous cavities in an abnormal way. The kidney function may be, and often is, entirely normal and yet fluid is retained in the tissues. Clausen has found constantly present in the blood of the nephrosis type, substances which are capable of changing the surface tension of the blood and the permeability of cells. This substance is excreted in the urine and is produced in the body as a result of infection. Marriott and Clausen believe that this substance is responsible for the changes occurring in the kidney and the development of the edema through its influence on the surface tension of the blood and effect upon the permeability of cells.

Of the two chronic types, the mild type or so-called pedo-nephritis of Heubner is fairly common. Some of the cases occasionally follow the acute hemorrhagic nephritis. Generally they seem to appear from nowhere and without assignable cause. Heubner and most other observers believe, however, that in the chronic types, also, infections play the principal rôle as etiological factors.

The nephritis may last for months or years, with the little patient, except for an anemia, seemingly in good health. There is no edema, hematuria or high blood pressure. All functional tests are practically normal. Casts will be seen only if there are slight acute exacerbations. Most of the cases gradually clear up.

A more severe type, particularly if it follows acute hemorrhagic nephritis, may present the picture of the adult type of chronic diffuse nephritis. There is marked anemia. The skin is pale and waxy. Edema is generally pronounced. The urine is scanty, containing much albumin and many casts and some blood cells. The functional tests show a severely damaged kidney. Uremia is liable to supervene. This type is much more rare than the mild pedo-nephritis. The prognosis is not good.

The second chronic type is the true chronic interstitial nephritis with contracted kidney—a condition similar to the type so common in the adult. It is exceedingly rare in childhood. These cases show polyuria with urine of low specific gravity. There is albumin with few casts. Headache and visual disturbances are common. The blood pressure is high. The heart is enlarged. Albuminuric retinitis is often present. All functional tests are low. The prognosis is always bad. Fortunately,

the condition is exceedingly rare. Symptoms of infantilism are sometimes associated with this type.

There has been much discussion as to the value of the functional tests used in the diagnosis of nephritis. It is safe to say at the outset that they are by no means as valuable or certain in the diagnosis of the nephritis of childhood as they are in that of the adult.

Hill divides kidney function tests into two broad groups: (a) those that measure the power of the kidney to excrete chemical substances not ordinarily contained in the food; (b) those which measure the ability of the kidney to excrete substances ordinarily contained in the food.

The kidney has three important functions. It must excrete nitrogen, salt, and water. The functional tests are based on this fact and are essentially a determination of the rate or volume of such excretion. For practical purposes only four tests need to be considered.

The phenolsulphonephthalein test devised by Rowntree and Geraghty is valuable. It is carried out as follows: From three to six milligrams of dye are injected intramuscularly. All urine passed for two hours is saved. The urine is alkalinized with sodium hydrate and diluted to one thousand cubic centimeters. The intensity of the resulting color is compared with that of a standard solution. The result is expressed in percentage of phthalein excreted in two hours. A normal child should excrete somewhere in the neighborhood of 75 per cent of the injected dye within two hours. An excretion below 60 per cent could be regarded as abnormal function. In the acute nephritis with impaired function the average excretion will run somewhere in the neighborhood of 59 per cent, about 17 per cent under normal; in the chronic nephritis, 63 per cent or about 13 per cent under normal. This test, while probably the best one we have, is nevertheless not always significant in children. Severely damaged kidneys may show almost normal phthalein excretion. A decidedly low percentage of excretion is, of course, always very valuable. It indicates the severity of an acute case and the extent of damage in the chronic case.

The two-hour renal test elaborated by Mosenthal is valuable and can be readily carried out by anyone and anywhere. This test is based on the fact that the kidney expresses its diminished power to functionate by a fixation of its power of concentration. In the damaged kidney the specific grav-

ity of the urine remains fixed for indefinite periods regardless of dietary or other influences. The nitrogen and salt concentration in the urine show hardly any variation. The specific gravity of the urine may be low or high. The technique of the test is very simple. A full diet is given containing a liberal amount of protein, purin extracts and of salt. Hill gives an outline of such a diet.

<i>Breakfast</i>	<i>Dinner</i>
Cereal—2 tablespoonfuls	Chopped Meat—2 tablespoonfuls
Bread—1 slice	
Butter— $\frac{1}{2}$ square	1 Egg
Apple Sauce—2 tablespoonfuls	1 Potato
Milk—6 ounces	Butter— $1\frac{1}{2}$ cubes
Water—4 ounces	Milk—6 ounces
Extra Salt—1 gram	Water—4 ounces
Caffeine Sodium Benzoate—2 grams	Extra Salt—1 gram
	Caffeine Sodium Benzoate—2 grams

The caffeine is added to produce some diuretic effect on the kidney

The fluid allowance is fixed. No fluid is taken between meals. Two hour specimens of urine are collected, starting with six o'clock in the morning and continuing until six o'clock at night. The night urine is collected from 6 p. m. to 6 a. m. The specific gravity of each two-hourly specimen and of the night urine is taken. A fixation of the specific gravity in all the specimens indicates a loss of power on the part of the kidney to vary the concentration of solids in the urine and indicates impaired kidney function. The nitrogen and salt concentration of each specimen can be quantitated, but it is not necessary except possibly for the night urine. In the normal case there should be a difference of at least eight points between the highest and lowest specific gravity of the different samples. It is likely to run even higher. In the badly damaged kidney there is practically no variation at any period. The simplicity of the test and the ease with which it is applied commend it. In cases with marked edema and oliguria, it does not work well.

Determination of the blood urea nitrogen is a valuable test, particularly in the case threatened with uremia. The disadvantage of the test for the practitioner lies in the fact that it requires technical apparatus and knowledge of laboratory technique which may not be at his command.

Persistent urea nitrogen concentrations of 20 milligrams or over per 100 cubic centimeters of

blood should be regarded as abnormal. Still higher values would in a severe nephritis case give warning of impending uremia.

The added salt and urea test has a limited usefulness in children. It is tedious and difficult to carry out. The patient is put on a constant standard diet containing a known amount of nitrogen, salt, and water. The nitrogen and salt of the urine is quantitated daily until the excretion shows constant values. Two or three days are generally required. On the fourth day 5 grams of salt are added to the diet. For two days the urine is analyzed to determine how long it takes the kidney to excrete the added salt. Then 10 grams of urea are added and the rapidity of excretion of this determined in the same way. The test has only moderate value and is altogether too cumbersome.

Hugh Ashby, in the March, 1923, number of the British Medical Journal, describes a simple urea test which may not be without value. It is based on the fact that a damaged kidney is quite incapable of excreting a urine with a high urea concentration. The technique of the test is as follows: The bladder is emptied at 8 a. m. and immediately afterwards 10 grams of urea are taken in about 3 ounces of water flavored with Tincture of Orange. At 9 a. m. the urine is passed and again at 10 a. m. This specimen is kept for the estimation of urea. The urea is estimated by the hypobromite method. If the percentage of urea after the test exceeds two, the kidneys are fairly efficient; if below two, their condition is unsatisfactory. The test is surely simple and can be carried out by anyone.

In using the functional tests, it is better to use them together rather than singly. To some extent they are complementary. They are particularly valuable in determining the prognosis of a given case. Repeated low functional tests at intervals of a few months would warrant a poor prognosis. On the other hand, high phthalein excretion with fairly normal blood urea and good response to the two-hour renal test would indicate that the process is fairly mild and the damage to the kidney not great. Not any of these functional tests can, of course, compare in value with the careful daily clinical observation of a case.

In the treatment of the nephritides of children, two principles must govern. The kidney must be spared as much as possible, and care must be taken to prevent accumulation of waste products in the blood and tissues.

In the diet just two factors must be considered—the protein and the salt content. These substances pass only through the kidney. If the kidney function is inadequate, the partial or complete retention of these substances or their end products causes trouble. All edema cases show marked salt retention. It is quite obvious that in all cases with this symptom at all pronounced, the diet should be salt-free. If the edema is moderate, a slight restriction of the salt, and the use, for example, of unsalted butter may be enough to meet the requirement. If there is no edema, the diet need not be salt-free.

As a general rule, it is not well to restrict fluid intake. It may be useful in cases with pronounced edema. The acute hemorrhagic type would do badly unless large amounts of fluid were given. It is generally safe to give as much water as the kidney can take care of. Most nephritic children can take as much as 48 ounces of fluid without showing weight gain or edema. If the urinary output approaches approximately two-thirds of the water intake, conditions are satisfactory. Even in severe cases of edema, the amount of fluid given should not be below 10 or 12 ounces per day. This amount must be regarded as a minimum requirement. Purging and sweating are good and useful measures, if not carried to excess.

The policy of keeping the protein intake moderate or low in all nephritis cases is probably safe and good, but not necessary in all types. There can be no question about it, of course, in the case showing retention of these products or with persistently low functional tests. A mistake is probably often made in restricting the protein intake too much. Some observers, notably Epstein, even go so far as to advocate a high protein diet for nephritics. The mere appearance of a large amount of albumin in the urine does not mean that one cannot give protein. Many observers have shown that it has no effect on the albuminuria and that it does not appreciably influence the blood concentration of nitrogenous substances. This is particularly true in the nephrosis type. Hill gives the average protein requirement of a nephritic child as somewhere between 1.5 to 2.0 grams per kilogram body weight per day. Neither protein, carbohydrate, nor fat has any influence on the edema. The diet, therefore, except possibly for a limited protein restriction, can be that of any normal child.

Drugs are not very helpful in the treatment of

nephritis in childhood. Some of them, for example the saline diuretics, may even be harmful.

A notable exception is the use of diuretin in the nephrosis type. Clausen has shown that this drug has a definite effect in altering surface tension. Its favorable influence upon edema is explained by this action and has definitely established it as a valuable procedure in the nephrosis type of case.

Diuretic drugs are always contraindicated if there is much hemorrhage. Digitalis is not necessary, as there is seldom any cardiac complication. Complete rest in bed is essential during any acute stage of the nephritis and absolutely necessary in any case showing edema. The moment the disease is recognized, any possible focal infection should be localized and cleared up if possible. The throat, accessory sinuses and teeth should have the most minute attention and thorough care. Recurrences of infection should particularly be guarded against, as the effect upon the kidney promptly manifests itself in the form of relapse or exacerbation of the nephritis.

The prognosis in the nephritides of childhood is uniformly good. Most cases recover within six or twelve weeks. The kidneys apparently can recover their function entirely. It has been quite definitely shown that an attack of nephritis in childhood does not predispose to the development of this condition in later adult life.

The following is an extract from a pamphlet written by a national lecturer for the Universal Chiropractors' Association and sent recently to our state legislators for their edification. Speaking of hay fever, "We say the reason the nose is subnormal is because the 'power within,' that built the nose and adapts it to all the stimuli from without, *cannot* get the adaptative impulses to the mucous membranes of the nose, because a vertebra in the neck is out of alignment and pressing upon the nerve over which these impulses travel, from the 'power within' to the membranes in the nose. We say the cure is self-evident, and consists of adjusting the offending vertebra to normal alignment, thereby removing the pressure from the nerve and permitting the adaptative impulse to reach the membranes of the nose. We entirely ignore the outside stimuli and the patient gets well.

"Absolutely the same explanation is given for all so-called germ diseases. We say for forty years germs have been accused of causing disease of various kinds, but never in a single instance have they been proven guilty. Forty years is long enough to prove anything true that is true, and the mere fact that scientists and the thinking members of other professions do not accept the germ theory of disease is proof in itself that it isn't correct."

JAMES G. GREGERSON.

THE CUTANEOUS LESIONS OF LATE SYPHILIS*

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Under the title of "The cutaneous lesions of late syphilis" I have included for discussion those lesions classified as belonging to the stage in which there is a tendency for the *Spirochete pallida* to become localized in the tissues.

I believe also that it is justifiable to include the lesions of the acute phase of the disease, which at times are found in patients who have had syphilis for many years, the so-called recurrent secondaries or relapsing types.

It is true that the transition from the acute to the late phase of the disease is usually very insidious. However, in certain patients this transition may be determined by the objective signs of the disease, particularly the skin manifestations. It might be said that syphilographers tend no longer to use the terms secondary and tertiary syphilis nor to speak of the stage of the infection in terms of years, but rather to speak of the "early" and "late" manifestations of the disease. The reason for this is, of course, readily understood when we consider that the transition from first to second and second to third stages is so indefinite. It is also unjustifiable to speak of the infectious and noninfectious periods, because *Spirochete pallida* have been demonstrated in the borders of late cutaneous lesions, although in very small numbers and after long search. The terms "early" and "late" syphilis are, however, terms of convenience. If this classification is accepted, it is necessary to add an intermediate type when referring to syphilis of the skin: the precocious or malignant, in which are evidences of both early and late stages. In other words, the cutaneous lesions may show simultaneously characteristics of both early and late cutaneous syphilids; also, lesions usually observed in cases of long standing may appear very shortly after the signs of the acute phase of the disease have subsided.

If we will dismiss from our minds for the time being the cutaneous picture of early syphilis, or

the period of dissemination of the *Spirochete pallida* and visualize the late period or the time at which the *Spirochete pallida* tend to localize in the skin or viscera, the classification of the cutaneous manifestations of late syphilis, as shown in Table I, seems justifiable.

SYPHILITIC LESIONS

If the late lesions of syphilis are regarded as granulomas, and if it is realized that the pathologic process is essentially the same in all of these late lesions, the foregoing classification will appear unnecessary. However, the nomenclature of cutaneous syphilis has been developed as the result of visual pictures rather than as the result of pathologic study; hence a classification is necessary. Various names often designate different phases of the same type of lesions.

The study of the immunology of syphilis has advanced considerably during the last few years so that we now endeavor to explain, in part, the various accidents of the disease on this phenomenon of immunity. In the late stage of the infection, or the period of localization of the *Spirochete pallida*, the organisms are scarce in the blood stream, viscera, and cutaneous lesions, due not only to the influence that has been brought to bear directly on the microorganism, but particularly to the protective reaction that has taken place in the tissues. To this reaction of the tissues the term "allergy" has been applied. It is also by this phenomenon that efforts are made to explain the varied pictures often presented by late, as well as early cutaneous syphilis.

Syphilis is notorious in its tendency to recur, or to light up and reappear while not being treated. At the same time it must be borne in mind that modern treatment has done a great deal to upset the mechanism of immunity, as the inadequately treated patient with acute syphilis is prone to have relapses and recurrences. The unfortunate patient who receives just sufficient treatment to break down the allergic reaction and allow the *Spirochete pallida* to remain disseminated and unrestrained, is likely to develop recurrences or relapses, and perhaps malignant or precocious syphilis. The histopathologic picture of the late syphilids is quite identical in all lesions; it is essentially a granuloma having its origin in the perivascular lymph spaces; it is always interstitial and appears first around blood vessels.

*Read before the Minnesota State Medical Association, St. Cloud, October 8-10, 1924.

The recurrent or relapsing lesions.—I may not be entirely justified in including the recurrent or relapsing lesions in a discussion of the late manifestations of the disease, but in view of the fact that theoretically the patient has passed through the stage of dissemination of the organisms when the secondary lesions have involuted, and the allergic phenomenon has been developed only to be shattered by one or several factors, and because of the many therapists who do not interpret the recurrent or relapsing lesions as a result of faulty defensive mechanism, I have included it. The recurrent secondary lesions occur in patients who have not had sufficient treatment during the early infectious period, and in those who have had no treatment, and whose own tissue reaction has been but temporarily developed. There are also certain patients who, in spite of prolonged intensive

ognized mercurial preparation, has been a factor in the production of this complication. The sites of predilection of the recurrent lesions are on the posterior aspect of the scrotum, glans penis, palms, soles, mouth, and the skin (Figs. 1 and 2). The lesions are chiefly of two types: the annular or ring shaped (Fig. 3), and the discrete papular. Depending on their location the papules may undergo maceration and erosion, resulting in the formation of "moist papules". At times there is a tendency for the papules to be grouped or clustered, assuming some of the characteristics of localization observed in the late lesions. The fact that the elementary lesions of this group are essentially papular, although not always necessarily so, and the fact that they tend to localize are evidence of the efforts of the disease to become latent. The *Spirochete pallida* may be easily recognized in

TABLE 1

Manifestations of late syphilis of the skin	{			mucous patches	
				Mucous membrane—condyloma	
		1. Recurrent—	Glabrous skin—	papular lesions	
				'annular lesions	
				serpiginous lesions	
		2. Early tertiarism—	Gummatous—	rupial lesions	
			(malignant syphilis)		
		3. Granulomas (classical late syphilis of the skin)	{	Nodular	agminate—confluent—squamous—cicatricial
					circinate
					serpiginous—squamous—cicatricial—
Squamous	crustaceous—ulcerative				
	diffuse				
Gummatous	diffuse—verrucous—crusted—rupial—ulcerative				
	tuberos—ulcerative—cicatricial				
4. Syphilis of the appendages	Nails	onychia spade nails			
	Hair				

(Modified from George Henry Fox)

courses of modern treatment, persist in developing recurrent lesions when treatment is stopped, and there are others in whom efforts to obtain abortive cure early in the course of the disease have failed because of the inefficiency of their resistance factors. I have noted that the extensive use of arsphenamin alone, when not followed with a rec-

these eroded lesions, by dark-field examination; hence they are to be classified as infectious. On the glabrous skin the lesions may appear as isolated grouped papules, annular or ring-shaped crudescences, or large gyrate macular figures without induration or necrosis.

Malignant syphilis.—The term "malignant" or

"precocious" syphilis is applied to those lesions which assume the characteristics of late syphilis, but which develop early in the course of the disease. The term early tertiary stage is perhaps more descriptive. The loss of the allergic reaction,



Fig. 1. "Moist papules" or recurrent lesions on the posterior aspect of the scrotum. Highly infectious.

besides an increase in the virulence or numbers of the *Spirochete pallida*, and possibly a dermatropic type of organism probably explain this phenomenon.

The distribution of the lesions of malignant

syphilis may be similar to that of the acute phase of the disease. The salient features are extensive gummatous ulcerations, resembling late tertiary gumma, with the constitutional symptoms of marked asthenia, loss of weight, and general malaise. Occasionally the ulcerations form large, piled-up crusts, to which the name rupia or oyster-shell crusts have been given.

It is fortunate that this form of syphilis is rare because some of these patients seem to be overwhelmed by a spirochetemia, and do not respond to any form of treatment, progressing to marked weakness and death. The majority of such patients, however, respond encouragingly to modern treatment. This form of the disease is often Wassermann negative, which possibly is also an expression of the lack of resistance displayed by the tissues.

Late syphilids.—The true tertiary syphilid (Table 1) is divided into three main groups: the nodular, squamous, and gummatous, each having individual subdivisions. The term "tuberculous gumma", or "tubero-nodular syphilid", and the various other combinations with the prefix tubero, as suggested by George H. Fox, have been omitted because of their tendency to confuse those not trained in the use of dermatologic terms, and because they are not descriptive.

The late syphilid, in general, presents essentially seven main characteristics. It is not practical to discuss these in the order of frequency, or their individual diagnostic value, because the late lesion presents one or two or all of these characteristics



Fig. 2. Recurrent papules on sole of the foot. Note the arciform tendency the lesions assume at the base of the great toe.

in varying degrees. It should be emphasized that every late lesion does not contain all of these characteristics, nor are they always of the same importance in the same type of lesion; likewise, that the diagnostic value of these pathologic processes depends on the location of the lesion; the type of skin, whether brunette or blond; the racial ten-

portant part in the production of gummatous lesions. This has been proved experimentally. It has also been shown that the *Spirochete pallida* exists in the advancing border of the ulcers, but usually in such limited numbers that its demonstration is very difficult. In malignant syphilis the distribution may be that of a secondary syphilid with the tertiary characteristics.

Configuration.—The borders of the late lesions are arciform or polycyclic segments uniting to form arcs or semicircular plaques. This circular configuration occurs not only in the individual nodule or gumma but in the contour of the grouped lesions and plaques. Arciform, serpiginous, polycyclic, and kidney-shape, are some of the descriptive terms applied to the borders (Fig. 4). This characteristic may be explained by the fact that endarteritis and peri-arteritis are important factors in the pathologic process. It must be borne

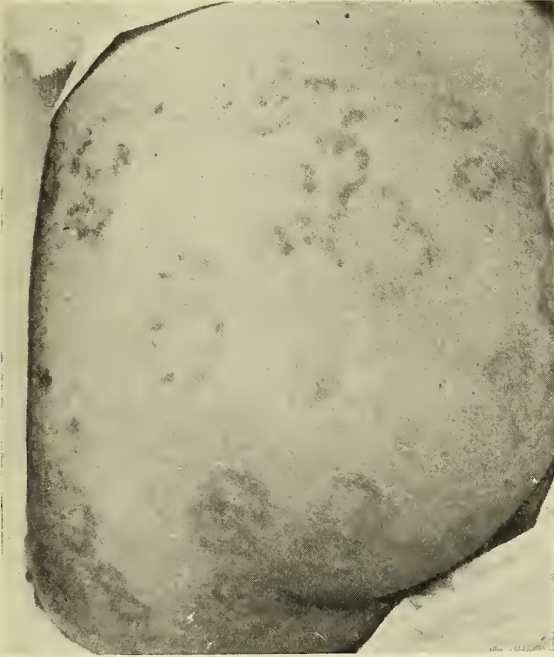


Fig. 3. The annular recurrent lesions on the buttock showing particularly the arciform configuration.

dencies, and the associated objective findings and collected data. Practically each of these features may be found alone or in combination in other dermatoses, so that the value of each individual so-called characteristic process must be weighed and interpreted in terms of the entire lesion.

Distribution.—The lesions of late syphilis are usually solitary or few in number. In view of the fact that they appear at a time when localization of the *Spirochete pallida* has taken place, the reason for the development of only a few lesions may be readily understood. They may, however, become very extensive and involve large areas, due to their ability to involute voluntarily and to recur, and also because of the simultaneous healing and extension. There are no classical sites for the appearance of the late lesions although there are areas in which their appearance is most common, as for example, the face, scalp, buttocks, palms, soles, shoulder, knees, and forearm. It has been recognized for some time that trauma plays an im-



Fig. 4. The nodular syphilid showing two of the characteristics: the arciform borders and the induration.

in mind, however, that all annular and round lesions are not syphilitic; they are often noted in other diseases such as the trichophytoses, erythema multiforme, granuloma annulare, and certain types

of epithelioma. The configuration is more distinct at a distance of 6 or 10 feet than close to the lesion.

Induration.—Induration or deep infiltration is a characteristic of practically all the late lesions of



Fig. 5. The superficial atrophic scar of the late syphilid; friable, soft, wrinkled, retaining the configuration of the original lesion.

syphilis. The degree of induration is dependent on the depth of the infiltration, and with experience may readily be differentiated from the induration of other granulomas. Particularly is the element of induration of diagnostic importance in the papular and nodular types of the disease. It has a definite diagnostic importance only when combined with other findings.

Destructiveness.—The late lesions of syphilis are, as a rule, destructive. Although they may not always undergo necrosis, replacement by fibrosis, with the other characteristic changes, is always of diagnostic value. The subcutaneous gummas may ulcerate or involute without destroying the skin. The amount of destruction varies with the depth of the infiltration. It is true also that the amount of scarring is proportionate to the amount of destruction of the deep tissues, although there may be scarring without ulceration of the skin.

Atrophy.—The pathologic process in the more superficial lesions is a loss of the elastica, resulting in atrophy, which is characteristic of the late lesions, and, even when occurring alone, is of considerable diagnostic value (Fig. 5). The scar is

usually of the thin, wrinkled, non-contractile, pliable, tissue-paper type, which retains the configuration of the lesion. In the massive granuloma the scarring may be extensive and deforming, depending on the depth of the involvement and the amount of the invasion of the underlying structures, such as bone and muscle. Superficial scars also result from epithelioma, various forms of cutaneous tuberculosis and superficial burns.

Residual pigmentation.—The peripheral residual pigmentation may persist for a considerable time after the granuloma has completely involuted. The pigmentation also retains the original configuration and the outline of the lesion. Many other dermatoses likewise resolve, leaving a residual pigmentation, particularly lesions in which stasis is a factor, and therefore residual pigmentation in itself is not pathognomonic of tertiary syphilis.



Fig. 6. Classical late syphilid showing the characteristics of the arciform configuration of the advancing border, peripheral extension, scarring, atrophy, and residual pigmentation. The induration does not show in the photograph.

Peripheral extension.—The tendency for the one-sided healing in the gummatous lesions with peripheral or centrifugal extension is common (Fig. 6).

The resulting scar which retains the configuration, pigmentation, and atrophy frequently breaks down and develops recurring granulomas some time after complete healing. The advancing border due to the coalescence of the nodules or ulcerated gumma, or of both, retains the diagnostic arciform configuration. The individual lesion, as well as the group of the lesions, retains this kidney-shaped, arciform, circinate, or polycyclic border.

Individual types of late lesions.—The predominate lesion of late syphilis is the gumma, and, depending on its visual characteristics, it may be roughly classified as nodular, squamous, and ulcerated. Depending on its secondary changes it may be serpiginous, agminate, circinate, rupial, verrucous, or cicatricial, either circumscribed or diffuse.

The nodular type, which is particularly common around the face, buttocks, and thighs, presents the characteristics of one or a few clustered, indurated nodules, with an arciform border, which may ulcerate, or involute without ulceration, resulting in the classical atrophic pigmented patch. This type of lesion must be differentiated from lupus vulgaris, fibroma, lipoma, chafed areas, sebaceous cysts, sarcoids, and rhinoscleromas. The salient features of this type of lesion are the induration and the border previously described, and the color, usually a dark cherry red, shading at the periphery to a brown which, although not pathognomonic, is of diagnostic value.

The serpiginous syphilid is a superficial nodular type of lesion that may or may not ulcerate, but extends peripherally, leaving a thin atrophic scar. The individual nodules desquamate, producing a scale, and at times a crust, if ulceration has occurred. The serpiginous syphilid must be differentiated from lupus vulgaris, psoriasis and epithelioma.

The squamous syphilid, which is most common on the soles and palms (Fig. 7), is at times difficult to distinguish from the common eczema, psoriasis, and trichophytosis of the palm. It is characterized particularly by atrophy, an arciform or circinate border, and tight adherent scales. It may be bilateral although it is usually unilateral. Vesicles, pustules, and pruritus are not found in the squamous syphilid, while atrophy, its most prominent characteristic, is not found in the differential possibilities. The presence of psoriasis elsewhere on the body helps confirm such a diag-

nosis. Also the recognition of mycelium from scrapings is a valuable differential point in the diagnosis of trichophytosis.

The gummatous lesions are not always characterized by ulceration, as this is merely a late phase of the gummatous process. Gumma may be either solitary or multiple; the former being the more difficult to diagnose because fewer diagnostic signs are present in the solitary lesions. As a rule there is very little pain with gummatous lesions, and the adjacent nodes are not affected. The non-ulcerated gumma may involute spontaneously or break down, fluctuate and ulcerate. The resultant necrosis has the characteristic configuration, with crusts growing freely on a dirty ulcer base, and induration, with a tendency to extension and healing at the same time. The gummatous lesions must be differentiated from two other main groups:



Fig. 7. Squamous syphilid of the hands. Note the outline of advancing border, also the atrophy along the index finger.

lesions occurring before ulceration, and those occurring after ulceration. Before ulceration, the differential possibilities are erythema nodosum, furuncles, and lupus vulgaris. After ulceration the possibilities are more numerous and include varicose ulcers, sporotrichosis, traumatic ulcerations, ecthyma and scrofuloderma.

Rupial lesions are ulcerated gummas on which the crusts, made up of inspissated pus, have piled up layer on layer until they have taken on the appearance of oyster shells. The crusts persist so long as active ulceration lasts.

Scars.—Scars of late syphilids are diagnosed by the residual atrophy, pigmentation, configuration and the amount of destruction caused. Certain scars, such as those of erythema induratum, burns,

and certain basal cell epitheliomas, are almost indistinguishable, so that it frequently is necessary to look for other evidences of syphilis before reaching a final conclusion.

Leukoderma coli, or residual depigmentation and atrophy around the back and sides of the neck, is a valuable diagnostic finding.

Mucous membranes.—There are essentially four manifestations of late syphilis of the mucous membranes which are worthy of emphasis, the recurrent mucous patches and moist papules, atrophic glossitis, leukoplakia, and nodular and ulcerated gummas. Gummatous involvement of the bony structures of the mouth may result in perforation and necrosis of the mucous membranes.

The recurrent mucous patches may or may not be associated with the cutaneous recurrences. The characteristics are like those of the secondary mucous patches of the mucous membranes. A recurrent papule, because of its environment, becomes eroded and macerated, resulting in a small gray plaque, the borders of which are sharply circumscribed. The surface of these lesions swarm with *Spirochete pallida*.

The late lesions of the mucous membrane of the mouth are like the typical nodular and gummatous lesions of the skin. The tongue, fauces, and nasopharynx are the most common sites. A third type may be included in this group: sclerotic or atrophic lesions. These occur most often on the tip of the tongue in the form of atrophic glossitis, but at times the entire tongue may be atrophic. Interstitial glossitis of the entire tongue is also met with.

Leukoplakia of the mucous membrane is the most common of the late manifestations of syphilis of the mucous membranes (Fig. 8). There is also a type of leukoplakia which is the result of constant irritation and is not associated with syphilis. The syphilitic type is usually associated with atrophic glossitis, and differs clinically in that it is not the smooth, pearly white, glistening plaque of the traumatic type, but tends rather to be striated, of a bluish tint, and likely to be located where there are no sources of irritation, such as snags of teeth, tobacco cuds, and pipe stems. The removal of leukoplakial patches with cautery or radium is warranted not only as a prophylactic against malignant degeneration, which is quite common, but also to prevent the development of more leukoplakia. At the same time the removal of such irri-

tating influences as pipe stems and snags of teeth, is essential. Although nine different types of affections of the nail have been attributed to syphilis, there are really only two that are seen often enough to warrant mention here: the syphilitic onychia, and the spade nail as described by Varney.

Syphilitic onychia and pronychia may affect a few or all of the nails. The onset is insidious, with thickening, increasing brittleness, furrows, and depressions in the body of the nail. The matrix is, as a rule, affected so that the nails are shed from time to time, and are replaced at first by ill-formed nails. Suppuration and ulceration of the surrounding tissue may occur. The absence of pain is characteristic in syphilitic lesions of the nail. Of course, it is necessary to differentiate these lesions from trichophytic diseases, trophic disturbances, and psoriasis.

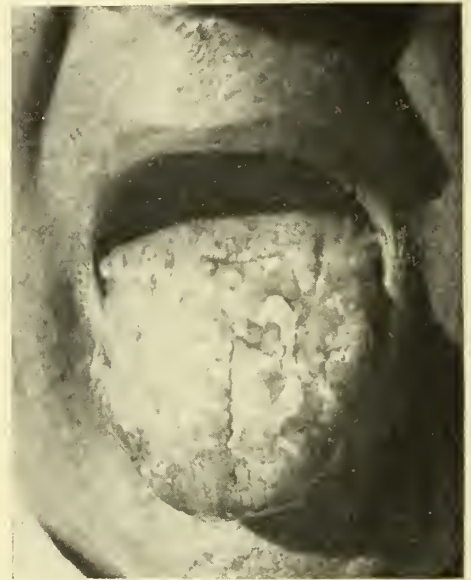


Fig. 8. Syphilitic leukoplakia with the associated atrophic glossitis.

The alopecia of the scalp of late syphilis is usually the result of a gummatous process that has subsided, leaving a scar that results in the destruction of the hair roots and bulk. Such signs as thinning of the hair are of minor importance.

The average Wassermann reaction in patients with late syphilis is 87 per cent positive; in other words, in the type of disease in which the Wassermann or the Kolmer test is the least necessary the percentage may be the highest. The frequent finding of the so-called Wassermann-fast group in

cases of late cutaneous syphilis, has been emphasized by Stokes. He reported that 17 per cent of cases of late syphilis eventually became Wassermann-fast cases. Half of these were shown to have evidences of cardiovascular involvement, and 6 per cent invasion of the nervous system.

In a review of the late cutaneous lesions, as observed at the Mayo Clinic, the following types and their frequency are noted: nodular 49 per cent; squamous 10 per cent; gummatous 26 per cent; and miscellaneous 15 per cent. This grouping is based on all the patients with cutaneous syphilis that have been examined at the Clinic. Of all the patients admitted with syphilis, 24 per cent were found to have evidence of cutaneous late syphilis. Weiss and Conrad report that 25 per cent of the syphilitic patients observed at the University of Washington in St. Louis, show evidence of late syphilis.

SUMMARY

The various types of recurrent and late cutaneous syphilis are itemized, and their important characteristics emphasized. These are the types of late syphilis in which the need for confirmatory serologic tests is least because the clinical findings are usually sufficient to warrant a diagnosis. The signs are valuable as aids to the diagnoses of syphilis of the viscera, and so forth, when the Wassermann test has failed to confirm a suspicion, the recognition of the cutaneous evidence of late syphilis clearing up an otherwise embarrassing situation.

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According to a recent opinion rendered by the Attorney-General of Minnesota pharmacists in this state are allowed to fill narcotic prescriptions for physicians licensed to practice in this state only.

CLINICAL OCULAR TUBERCULOSIS*

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I have chosen for my subject Clinical Ocular Tuberculosis, a subject in which I have become intensely interested from a practical standpoint in the last few years. For a long time oculists seemed to be of the opinion that tuberculous infection attacked only the choroid and posterior parts of the eyeball. We now know, however, that all ocular structures may be attacked either by the tubercle bacilli or the toxin produced by the accumulation of these organisms in parts of the body remote from the eye itself.

The clinical pictures of tuberculous diseases of the eye, as they show themselves anteriorly, are now quite familiar to the experienced oculist and it is not my purpose to describe them in detail here. All degrees of ocular pathology due to tuberculous infection are met with from the mildest cases of phlyctenular keratitis and conjunctivitis to keratitis profunda and from slight and quickly disappearing congestion and small hemorrhage of the fundus to massive exudates and rapid destruction of the ocular structures.

The literature of this disease has increased enormously in the past ten years and the success in treating this unfortunate infection I am happy to say has kept pace most satisfactorily with our knowledge of the disease itself. The vast majority of cases of the various forms of ocular tuberculosis is secondary to an infection elsewhere, but that it is sometimes primary in attacking the conjunctiva can no longer be doubted. I am not unmindful, however, of the fact that bodily epithelial coverings are resistant to bacterial infection, so primary tuberculosis of the eye can only take place as a result of trauma.

Our knowledge of the clinical phenomena of ocular tuberculosis has been vastly augmented by experiments recently made by some of the most prominent ophthalmologists, and chief among them Dr. William C. Finnoff, who has demonstrated that every type of ocular tuberculosis met with in the human eye can be reproduced in animals, and that the animals thus infected presented almost the same identical picture as that which we

*Presented before the Northern Minnesota Medical Association, Duluth, August, 1924.

see in the human eye. The most interesting part of the experiment is the fact that the introduction of an emulsion of the virulent tubercle bacilli into the healthy conjunctiva produced no result, but when the conjunctiva was incised or bruised, typical tuberculous conjunctivitis resulted. Thus being able to produce tuberculous lesions in the eyes of the lower animals at will, has added immensely to the accuracy of our study of ocular tuberculosis.

Tuberculous conjunctivitis is not very common, but is met with sufficiently often in our practice to require a more careful study than it has yet received. It is met with in various forms:

1. Ulcers with ragged edges in which may be found the tubercle bacilli.
2. Cockscomb-like granulations closely resembling trachoma.
3. Tumor-like peduncular structures.

Tuberculous conjunctivitis is the most typical illustration of primary tuberculous disease of the eye, as particles of dust with sharp edges or foreign bodies of any kind having on their surface the tubercle bacilli may bring about this form of inflammation and by extension to surrounding structures may produce the same disease in the lacrimal apparatus and other adjacent structures.

Igersheimer contends that tuberculous conjunctivitis is always primary.

Perhaps the most common form of inflammatory disease of the eye to be mistaken for other inflammatory troubles is tuberculous iritis, which is secondary to a primary focus in some other part of the body, usually the lungs. The symptoms of tuberculous iritis are very much the same as other forms of iritis with the addition of the formation of the nodules. They are usually to be found close to the pupil or the ciliary margins. In the early stages they are very small, requiring the aid of the loop to be seen. Only too often "K.P.s" can be found on the posterior parts of the cornea, indicating ciliary involvement; occasionally, they become massed together, presenting the appearance of a yellowish-white tumor. At this stage this form of iritis may be mistaken for gummatous iritis; a negative Wassermann or the failure of the ocular congestion to respond to tuberculin guides us to a correct diagnosis. Associated with this is usually a well-marked circum-corneal ring of congestion. If the case is tuberculous, the congestion is intensified by a small hypodermic injection of tuberculin.

In this way tuberculous iritis is differentiated from the same disease due to other causes.

A most careful study of this form of tuberculous infection was made by Dr. E. B. L. Brown, of Chicago, which he read in the section of Ophthalmology of the American Medical Association at its 56th annual meeting. A splendid review of the literature on the subject up to that date was published with this paper.

Tuberculous keratitis has also become a most interesting study in recent years. This lesion shows itself in the form of nodules, large and small, in the corneal structure, usually complicated by intense vascularity and photophobia. This condition is usually the result of the extension of the disease from the uveal tract, although a number of cases have been reported in which the starting point was trauma. It is in this form of tuberculous disease that we often have the most wonderful results by the careful and prolonged use of small doses of tuberculin. This refers especially to that variety of non-healing abscess and ulcer of the cornea, formerly called scrofulous.

In addition to the already described types of ocular tuberculosis, we meet with disease of the fundus due to systemic tuberculosis. This usually shows itself in a periphlebitis and vasculitis resulting in repeated hemorrhage into the vitreum and retina and also in certain forms of exudative chorio-retinitis. This may occur independently or associated with the different forms of this disease described in this paper.

Von Hippel recently reported a case in which after the disappearance of the deep corneal infiltration and iritis with typical nodules, characteristic pictures of retinal perivascular tuberculosis became visible. Under tuberculin, all the foci healed entirely.

Notwithstanding the enormous number of most favorable reports we find in the pages of ophthalmological literature in regard to the successful treatment of tuberculous eye diseases by tuberculin, we still occasionally meet a "doubting Thomas" who fails to recognize its value, although Fuchs, with whose genius and unerring judgment we are all familiar, declares that he is now able to save eyes that he formerly enucleated, with resulting good vision, by the prolonged use of small doses of tuberculin. Men like Treacher Collins speak in the highest terms of its usefulness. DeSchweinitz reports in his text book the wonderful results in

treating this same class of disease by this very reliable therapeutic agent.

After having observed with careful attention the beneficial effect of tuberculin in a vast number of cases myself, I agree with what Von Hippel declared in one of his early reports that we possess in tuberculin a means which if rightly used will permanently heal sufferers from tuberculosis of the eye.

I also agree with Mr. C. J. Campbell Faill of Bristol in regard to tuberculin, that its use requires knowledge and care and in no department more than in the treatment of tuberculous disease of the eye, but if administered judiciously and skillfully, it can, in a very large number of cases, produce complete and permanent cure. However, in eye lesions, associated with active lung disease, the best results are obtained by sanatorium treatment rather than by tuberculin.

In a recent paper, Goitz sums up by saying that tuberculin is a most valuable agent. The tuberculous lesions improve under its use and cure takes place in the majority of cases. Its principal field of usefulness is when simple therapy fails. It should be used as early in the disease as possible. Dr. E. B. Miller, of Philadelphia, has reported some cases of delayed union following operative procedures which healed promptly under tuberculin treatment after all other remedies had failed.

Drs. Jackson, Magruder and others have called our attention to the distressing asthenopia which is met with in tuberculosis subjects which are greatly relieved by carefully correcting the refractive and muscular deficiency, thus adding much to the comfort of the patients during their convalescence.

A word in regard to the phlyctenular group of eye diseases: the evidence that they are the result of tuberculous infection is overwhelming.

Dr. Wilder, when he was Chairman of the Committee of the Ophthalmological Section of the American Medical Association for the study of the relation of tuberculosis to diseases of the eye, reported that in 51 cases of phlyctenular diseases of cornea and conjunctiva, 47 showed distinct evidence of tuberculosis, either in quiescent or active form. Colmans, in his recent paper, called our attention to x-ray demonstration, that the majority of patients belonging to this group have enlarged broncho-tracheal glands. Weekers and Colmans have pointed out in recent writings that evidence of this is accumulating more and more as we con-

tinue to investigate. In 50 cases recently examined, enlargement of the broncho-tracheal glands was demonstrated.

Through the instrumentality, foresight and energy of Dr. H. Longstreet Taylor, of St. Paul, we have established in our city a Preventorium for the care and treatment of tuberculous children. For a number of years the St. Paul Free Dispensary has been sending its ocular tuberculosis cases to this well-managed institution. Many of these children developed phlyctenular keratitis and conjunctivitis. I have had the opportunity to make a careful study of treating them with and without tuberculin. In those instances where, for some resulting in repeated hemorrhage into the vitreous reason, tuberculin treatment was neglected, the children made little or no improvement as to their eye condition, but with the tuberculin treatment all these symptoms disappeared with marvelous swiftness to the perfect satisfaction of parents, nurses and physicians. Not only did this treatment seem to relieve the eye conditions, but it aided quickly and most satisfactorily in the improvement of their general condition.

Associated with the St. Paul Free Dispensary is a most efficient tuberculosis department conducted by Dr. E. B. Daugherty. All of our tuberculous eye cases are referred to that department and the treatment conducted and applied by Dr. Daugherty. We have the same arrangement now with our new dispensary service directed by the Wilder Charities.

The kind of tuberculin used is not a matter of importance, but it is important for the physician to comprehend the underlying principles of tuberculin therapy together with its limitations. The type of cases and the dosage suitable to each individual case is far more important than the kind of tuberculin used. Tuberculin, therefore, is one of the most useful therapeutic agents that we have at our command when suitably applied and one of the worst and most dangerous in unsuitable cases and unsuitable dosage.

DISCUSSION

W. E. PATTERSON (Minneapolis): Dr. Fulton has selected a very interesting and vitally important subject for his paper. Tuberculosis of the eye is a disease that until recent years has been little understood.

In retrospect, we who are engaged in treatment of eye disease can see where we have failed to recognize this very common form of ocular disease because of our lack of

knowledge of tuberculosis in its incipency, and the many varied forms occurring in its development.

At the present there is a great difference of opinion as regards the presence of primary ocular tuberculosis.

The difficulty which Dr. William H. Finnoff, of Denver, encountered in his experiments on rabbits' eyes in establishing an infection of the external structures of the eye would lead to the supposition that exogenous infection would be very much the exception if it ever does occur, and that intraocular tuberculosis must be of metastatic origin, as it was necessary in every instance to introduce the virulent organisms directly into the tissues to get a lesion. When the organisms were injected into the blood stream, all forms of intraocular lesions that are common to man were seen to develop.

Tuberculosis of the eye occurring in childhood has been insufficiently studied, especially from a histological standpoint. There may be no other evidence of infection and Pirquet's reaction may be negative.

Tuberculosis should always be considered where acute or chronic inflammations, particularly of a recurring type, do not yield readily to treatment and where no other form of infection can be determined, bearing in mind that it is a common cause of keratitis, cyclitis, choroiditis and scleritis.

As yet I have found no explanation for the absence of the Pirquet reaction in many cases of ocular tuberculosis in children, or for the rarity of ocular tuberculosis in the presence of extensive lesions in other parts of the body.

The development of tuberculin therapy, as is in use today, has made it almost specific in the treatment of early tuberculosis and is a real scientific achievement. Hence the need of early diagnosis.

We should always bear in mind that the best results are obtained by starting with the infinitesimal dose of tuberculin and gradually increasing as the patient shows evidence of immunity.

DR. TUOHY (Duluth): As I have listened to this very interesting paper by Dr. Fulton, I am attracted particularly by what he says relative to the influence of tuberculin upon

the lesions which can be so easily watched during the course of treatment and essential changes noted. Tuberculin, in the treatment of general tuberculosis, and notably tuberculosis of the lungs, has been more or less abandoned. Nevertheless, there has remained this very logical use for tuberculin in conditions of the eyes, and we know that it has a decided field of usefulness in localized tuberculous adenitis. Possibly if we knew more about how to use it and under what exact conditions, it still might be found, as in the hands of some men who still use it, to have a much wider field of accepted usefulness.

We are much indebted to Dr. Fulton for this splendid review.

DR. CALLAHAN (Pokegama): It is very interesting for those of us who are engaged mainly in the treatment of pulmonary tuberculosis to hear something of the diagnosis and treatment of the more special tuberculous conditions.

In a very limited experience with tuberculous eye conditions, I agree quite heartily with Doctor Fulton on the value of tuberculin in the treatment of ocular tuberculosis in the absence of a progressive tuberculous lesion in other parts of the body. About three years ago, Corper and his co-workers of Denver published an article on the eye as a portal of entry for tubercle bacilli in pulmonary tuberculosis. In Corper's opinion, many viable tubercle bacilli get into the eye from dust and the spray from the cough of positive cases, which are carried through the tear ducts into the posterior pharynx and from the pharynx into the trachea and lungs in a very short time. It just occurred to me that in cases of previous injury or disease of the conjunctiva some of these bacilli may occasionally cause a primary ocular tuberculosis.

DR. A. T. LAIRD: I was very much interested in Dr. Fulton's paper especially in his reference to the use of tuberculin. In no form of tuberculosis has the value of the tuberculin treatment been more thoroughly established than in lesions affecting the eye. Several of our patients who have had keratitis and phlyctenular conjunctivitis have improved under tuberculin treatment given in connection with usual sanatorium care.

PHYSICIANS ATTACK MACFADDEN JOURNAL

An attack on *Physical Culture* magazine, a Bernarr Macfadden publication, is featured in the November *Hygeia*, popular health magazine published by the American Medical Association.

The magazine announces that this is the first of a series of articles entitled "Exploiting the Health Interest" which will discuss the manner in which the desire for health and the hope of relief from suffering and disease are exploited by promoters of peculiar cults and fads.

"Future articles," says the magazine, "will deal not only with other Macfadden periodicals but also with all the prophets of nondescript cults that thrive on the delusions they create in the minds of the sick."

After characterizing *Physical Culture* as a magazine edited for morons, every issue of which reeks with sex appeal, *Hygeia* takes up the type of advertising that makes *Physical Culture* commercially profitable. It publishes reproductions of advertisements, formerly carried by *Physical Culture*, of concerns that have been declared frauds by the federal government and debarred from the use of the mails.

"The amount of harm that *Physical Culture* does is incalculable," says *Hygeia*. "Not only does its advertising pages inevitably tend to destroy public confidence in the printed word, but its editorial pages pervert public intelligence on matters pertaining to scientific medicine and promulgate doctrines that have pernicious and far-reaching effects on the public health."

PERIODIC PHYSICAL EXAMINATIONS*

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Osler said that "Sanitary science, hygiene, or preventive medicine may claim to be one of the brightest spots in the history of the nineteenth century;" and certainly in the twentieth century so far, the distinguishing emphasis of scientific medicine has been on prevention rather than on cure.

While this fact is more or less generally recognized, we may not keep in mind the profound changes that it has been responsible for in both medical theory and practice. The "healing art," which was for centuries descriptive of the scope of medicine, would today be grossly inadequate. The limits of "healing," or the restoration of diseased tissue, especially of the chronic types, are so restricted as to make medical practice relatively discouraging, were not this vast and largely unexplored field of prevention widening before us.

While each of the steps in the preventive field have been notable in themselves, they have only gradually brought to the medical profession a new conception of its relationship and obligation to the general public. The traditional attitude of medicine has been mystical, secretive, exclusive. Perhaps as a healing art this had some justification. The prescription written in Latin probably carried added potency, but in the preventive field the educated, enlightened co-operation of the lay public is absolutely essential to any real progress.

As a conception of the possibilities of preventive medicine has gained a hold on the imagination of the profession, and the necessity for the education and understanding of the public becomes recognized, our members have gradually—all too gradually—reversed the traditional attitude, and are now seeking to educate the layman into the principles underlying medical science, and into its practice as it relates to the preservation of health and prolongation of life.

Two striking illustrations, from many, will suffice to show the necessary trend from medical practice as a healing art to preventive medicine as a universal social benefaction.

First came the discovery and use of quinine as a cure for malaria, a method of healing for medical practice; then the discovery of the mosquito as the carrier of the malarial parasite, and the method of prevention for the state and the public at large.

Also, the treatment of diphtheria by intubation, a real contribution; then by antitoxin, a far greater contribution,—both a method of healing for medical practice. But now we have toxin-antitoxin, the greatest of all, but requiring the intelligent and informed co-operation of the public to be made effective.

Preventive medicine, both from the professional and lay viewpoint, has no more important, though relatively neglected, opportunity than the periodic physical examination. Here the layman is absolutely dependent on the medical profession for service, instruction, and advice. He cannot, as in other fields of preventive medicine, take this scientific contribution as he did the discovery of the transmission of malaria, and apply it by sanitary regulations or engineering methods.

In the prevention or treatment of practically all forms of disease—acute, chronic, infectious, or toxic—the periodic physical examination is of the greatest value, both in maintaining a standard of personal hygiene and health which may prevent the onset or modify the progress of disease, and in showing the earliest stage of disease when it may be susceptible to cure or arrest.

Today, the wisdom of the periodic physical examination is so generally conceded that it is a matter of astonishment that it was little heard of until the past decade, and that it is comparatively so little practiced by the profession or the layman.

It will not be the purpose of this paper to present the blanks of the periodic examination, nor to cover in detail the diseases which it may reveal, nor the treatment which may be based upon its data. Approved forms have been prepared by a committee of the American Medical Association, and are obtainable from that organization; the symptoms and signs developed, and their interpretation, are merely clinical medicine.

It may be of interest, however, to inquire into the cause of the comparative failure of the periodic physical examination to gain its proper recognition in practice, and also whether experience so far obtained justifies the claims made for it.

*Presented at the annual meeting of the Minnesota State Medical Association, St. Cloud, Minn., October 19, 1924.

There are two essential factors in the successful practice of the periodic physical examination:

1. An educated public,
2. A competent profession,

each being very dependent upon the other as a necessary complement.

Education is a slow and laborious process in any field of knowledge. This would be true if all adults reached even a moderate degree of mentality. But when mentality is of such wide variation, and when so large a proportion of the population is of very low natural intelligence, and equipped with but meager education well diluted with superstition, ignorance, and misinformation, it is easier to understand the very gradual spread of the appreciation and utilization of some of the most important scientific contributions.

Sickness has for ages been thought of as the punishment or manifestation of displeasure of gods or a god, depending on the particular theological dogma; and the most potent preventive measures have been prayer or votive offerings, supplemented in the post facto emergency of active illness by the remedial devices of the healing art.

Belief in sickness as sin and health as virtue, uninfluenced by mere material conditions, is only a modern variation of this superstition, which is even today reflected to a greater or less extent in the prayers, doctrines, and practices of nearly all varieties of religious faith.

As appreciation of the value of the periodic physical examination is incompatible with such a belief, it is not so surprising that progress is slow. The layman must be taught to realize that health is determined by a normal functioning of the spiritual, mental, and physical elements in the human trinity; that a careful history and examination will in many cases reveal that an abnormal condition exists in one or all of these factors, and that knowledge of the true condition existing at certain periodic intervals gives an intelligent basis for continuing a condition of health or correcting any abnormal variation which may be present.

However, in spite of reactionaries and fundamentalists in secular directions as well as in religion, education is spreading rapidly, and ignorance and superstition are giving way before it. More and more, national and local legislative action is based on the Gladstone doctrine that "In the health of the people lies the strength of the nation." This has been for long recognized in the

emergency of war, but now is recognized in the progress of peaceful development.

It was interesting and encouraging recently to have Secretary of War Weeks ask for national health as a feature of Defense Day, calling upon the medical men in each community to "issue friendly advice to their fellow citizens" and to provide for examination to assess the "vitality of our citizenship."

Industrial competition is a new and potent factor in education for better health standards. Most industries of the higher grade now require health as a condition of employment, and inaugurate employment with a physical examination, required or offered at subsequent intervals not longer than one year throughout the period of service.

Life insurance companies, with their fully equipped medical departments, have had wonderful opportunities, only partly embraced, to spread through policyholders and agents sound health propaganda. Many of these companies are offering periodic physical examination free of charge to policyholders and employees,—and about 5 to 7 per cent take advantage of this offer.

Several cities—Pittsburgh, Boston, New York—have offered periodic health examinations at municipal clinics, and these have been well patronized.

Numerous commercial enterprises, more or less legitimate, have sprung up in response to the popular demand for these health examinations. One of them, the Life Extension Institute, cannot be too highly praised for the splendid educational and practical work which it has done through its bulletins, advertisements, and health service. Many other similar institutions, however, are merely quack replicas of the Institute, and are doing the cause of legitimate preventive medicine much harm.

There is, however, some evidence that public education in the periodic physical examination has advanced beyond the stage where adequate appreciation by the medical profession always meets the need. It is a very common experience in insurance medicine and in periodic physical examination work to come across instances where interest of the layman in his health or in health examination has been ridiculed or discouraged by the physician, or met with indifference. Some physicians take the position that periodic examinations tend to make the individual nervous or a hypochondriac. A re-

quest for a careful examination is met by a joking reassurance.

The time is passing, however, when jovial optimism can acceptably replace careful, intelligent, and scientific clinical methods. Optimism may be the wisest of therapeutic agents, but, as with any therapy, it should follow and not anticipate or replace diagnosis. Any such reversal of sequence is extremely dangerous.

Comparatively few practitioners today, except pediatricians, oculists, and dentists, are urging periodic health examination on their patients. This failure is due to several causes. In the first place, in city practice the family physician is becoming less common, and obviously a patient cannot go to ten or twelve specialists each year for as many special examinations.

Then again, the practitioner often hesitates to urge well people to come to him for periodic examination for fear that he may be suspected of urging unnecessary work and expense for his own profit.

Possibly some physicians are too careless and slipshod in their history records and examination methods to make worth-while use of the periodic physical examination opportunity and data.

Undoubtedly, also, some physicians are skeptical about the real value of the periodic examination. It is quite true that it has not fully met all the enthusiastic claims that have been made for it. It has suffered, as have other good movements, at the hands of its friends. Periodic examinations will not make everyone live to old age. Their possibilities are strictly limited. Medicine is far from an exact science. Even with the most complete and prolonged clinical and laboratory examination, disease may be overlooked and data misinterpreted. An ordinary periodic examination must be relatively simple and superficial.

Less emphasis should be placed upon the value of the periodic examination in revealing disease, and more stress should be put upon its great value in health education. At the periodic examination the opportunity can be utilized, by the wise practitioner, to teach men, women, and children to live wholesomely, not necessarily or merely to have some insidious disease detected.

And above all must the profession take the opportunities offered by the periodic examination for profitable treatment or operation, with the greatest conservatism and singleness of purpose. The man who recommends that he or his consulting col-

league remove every enlarged tonsil found on examination, treat every symptom or correct every physical deviation from an arbitrary standard, is practicing meddlesome medicine or surgery, and is discrediting his profession.

But while frankly facing the possibilities of abuse, let us not fail to appreciate the great value of the periodic physical examination, nor the high standards of service and practice by the large majority of the profession.

The periodic examination is educational to the patient and the physician,—each knows the other better, to their mutual advantage, both during continued health and also when any symptoms or signs develop. Rather than making a patient nervous, a well-conducted physical examination is the best possible remedy to calm and relieve nervous fears. If an examination worries or distresses a patient instead of cheering and comforting him, the physician who has such an experience should closely examine his own methods and mental attitude.

Each step in the examination gives opportunity for advice and counsel in the prevention of disease and maintenance of health of priceless value—if the examiner is qualified to give it. Posture, weight, mental attitude, work, exercise, diet, water, sleep, recreation,—and all the other factors known to modern science as of so much more importance in maintaining health than medication or operation,—are discussed to the infinite benefit of the layman.

And of importance, too, is the finding of early and curable disease,—the trace of sugar or albumin, the rising blood pressure, the neglected eye strain, the toxemia, the early or precancerous ulcer or tumor, the beginning thyroid enlargement, anemia, and other signs and symptoms which may be invaluable indications of needed treatment.

Ordinarily it would be extremely difficult to accurately evaluate the good accomplished in promoting health and prolonging life by such a variable factor as the periodic examination, but fortunately there are several sources of information which throw a definite light on the subject.

In factories and offices where the periodic examination has been adopted as a routine practice, a very marked reduction in absenteeism for sickness has been observed. There are usually other favorable factors introduced at the same time, such as more adequate treatment, health educational

propaganda, etc., but unquestionably the periodic "health audit" is a most important factor.

When we realize that \$3,000,000,000 is the annual tax levied by illness last year in this country, we can gain some conception of the need for every possible preventive measure.

The most striking proof, however, of the definite value and benefit from the periodic examination, is the experience of the Metropolitan Life Insurance Company. This company was the first to offer its policyholders periodic physical examination, which it did through the Life Extension Institute, immediately on that institution's organization in 1914. From 1914 to 1922, 63,000 periodic physical examinations were made, at a cost to the company of \$225,000. In order to obtain as long an experience as possible, the policyholders who took the examination during 1914 and 1915,—5,987 in all,—were intensively studied in the light of subsequent experience. This group had an experience of 33,629 years, and showed 217 deaths, as against an expected death loss of 412, according to the American Experience Table,—or an actual mortality rate of 53 per cent. The lower death rate was for practically every age period, the most favorable being from ages forty to sixty, inclusive.

While this was perhaps a select group, as naturally the more intelligent and careful would accept

the offer of the examination, on the other hand, many who elect examination do so because of some symptom from which they may be suffering.

The Metropolitan studied these policyholders critically, and their final opinion was that they had saved in actual dollars and cents from mortality, two for every one they had spent on periodic physical examination.

This striking and definite statistical study, supported by the best clinical opinion as to the value of the periodic examination, should induce each member of the profession to lend the weight of his influence among his friends and patients, and with the public at large, to urge every man, woman, and child to have at least annually a thorough, competent examination.

I trust, also, that this Society may intensively co-operate with the American Medical Association in furthering interest among our members in this field, either through the active work of one of our committees already appointed, or by a special committee, as has been done in other State societies.

In enlarging the routine practice of the periodic physical examination, we shall contribute in no small measure to the great service which our profession is rendering humanity in the maintenance of public health and in the prolongation of human life.

THE BAN ON HEROIN

As long ago as 1917, the Council on Pharmacy and Chemistry deleted heroin from its handbook of Useful Drugs, saying: "The Council holds that heroin has no advantage over morphin; that it has every disadvantage of morphin; and that on the whole its introduction has been harmful, in that it furnished a specious means on the one hand of avoiding the well founded popular fears of morphin by substituting another habit-forming drug." In 1920 the House of Delegates resolved, "that heroin be eliminated from all medicinal preparations; that it should not be administered, prescribed or dispensed; and that the importation, manufacture or sale of heroin should be prohibited in the United States." The recent Congress enacted, June 7, 1924, a bill prohibiting the importation of opium intended for the manufacture of heroin. The Federal Narcotic Control Board has announced that it will not authorize the importation of any opium intended to replace opium or morphin thereafter converted into heroin. This will prevent the open manufacture of heroin in the United States, and as none can be lawfully imported, heroin will soon disappear from the legitimate market.—(*Journal A. M. A.*, Sept. 6, 1924, p. 784.)

BENZYL BENZOATE AND ARTERIAL HYPERTENSION

While the Council on Pharmacy and Chemistry recognizes the existence of honest differences of opinion on many therapeutic questions, and desires to be liberal in its attitude toward all worthy innovations, it refuses to admit claims which are neither in harmony with already accepted facts nor supported by acceptable evidence. The wisdom of this rigorous attitude has been recently demonstrated anew with respect to the widely acclaimed benzyl benzoate. The Council has insisted that its clinical use is still in the experimental stage, despite the alluring announcements of the various alleged virtues of the compound. Benzyl benzoate has, for example, been recommended and doubtless frequently prescribed for reduction of arterial hypertension. A careful clinical study, however, shows that benzyl benzoate, if taken in 25 to 30 drop doses (20 per cent alcoholic solution), has no effect on blood pressure. Furthermore, even continued therapeutic administration over a period of days produced no effect on the blood pressure of patients suffering with hypertension.—(*Journal A. M. A.*, Oct. 11, 1924, p. 1171.)

INDICATIONS AND TREATMENT OF ACUTE SUPPURATIVE MASTOIDITIS*

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St. Paul

The presence of so many discharging ears is a positive indication that active measures have been sadly neglected in the treatment of acute mastoiditis. The production of a chronic running ear should be regarded as a serious offense in preventive medicine.

Even today, in the light of a better knowledge concerning mastoid disease, better laboratory and x-ray facilities, more and better qualified otologists than ever before, chronic ears are still prevalent, which leads the writer to but one conclusion, namely, that many of us err on the side of conservatism.

True, there are undoubtedly fewer discharging ears than existed fifteen and twenty years ago, due to: first, the fact that general practitioners and particularly pediatricians, who see so many of these acute cases, treat them with early free incision of the drum membrane and are capable of recognizing mastoid symptoms and call an otologist when conditions seem warranted; second, early removal of tonsils, adenoids and nasal irregularities; third, better care given the patient's general condition.

Tivnen, in a masterly paper in 1919, says considerable difference of opinion may arise among otologists in the interpretation of the various symptoms encountered in acute mastoiditis but practically all are agreed on the following conditions: (1) that the majority of acute mastoiditis cases are chargeable to an extension of a suppurative otitis media to the mastoid cells; (2) that the majority of suppurative middle ear infections are caused by diseased processes in the nose, throat and naso-pharynx; (3) that a moderate amount of mastoid tenderness and a varying degree of mastoid involvement is present in the majority of cases of acute middle ear suppuration, but this mastoid infection and tenderness, if early and adequate drainage be provided, may, unless other determining symptoms develop, be accepted without alarm for several days and does not during this period

of observation demand a mastoid operation; (4) that in addition to the virulence of the infection and resistance of the patient, the particular build and architecture of the individual mastoid process is an important element in estimating and interpreting the clinical development; (5) that the mastoid of infancy or early childhood is anatomically different from that of the adult—that these anatomical variations are a determining influence in inaugurating and extending such infections, and must be reckoned with in interpreting their particular symptomatology.

In order to better understand and interpret the significance of the various signs and symptoms of this condition, it is essential that we briefly consider the pathology. Three stages are commonly recognized: first, the stage of congestion and exudation of serum; second, the stage of pus production; third, the stage of cell destruction and granulation formation. In the first stage, the mucoperiosteal lining of the cells becomes congested and an inflammatory reaction occurs with exudation of serum; the septa between the cells remain intact; the cells are red and filled with serum tipped with blood. In the second stage, the cells contain pus, the septa being preserved. In the third stage the septa break down, granulations develop, pus is formed in too great a quantity to be drained through the tympanic opening and endeavors to find an exit in the path of least resistance.

The history and general condition of the patient should receive most careful consideration. Inquiry should be made as to previous attacks. Experience has demonstrated that acute suppurative otitis media produced by an acute simple rhinitis or pharyngitis is less likely to involve the mastoid; while if the middle ear suppuration accompanies the exanthemata, diphtheria, septic tonsillitis or influenza, the dangers of mastoid extension are greatly increased.

The ordinary attack of acute suppurative otitis media with adequate drainage usually subsides within two weeks. Prolonged prostration, loss of appetite, anemic appearance, general lassitude and restlessness are all signs that suggest rather more than a simple middle ear infection alone.

The symptoms of mastoiditis may be divided into the following and each one will be discussed individually:

*Read before "Clinic Week," St. Paul, 1923, and the North Dakota Academy of Ophthalmology and Otolaryngology, Grand Forks, May, 1923.

1. Pain.
2. Tenderness on pressure.
3. Temperature.
4. Discharge from the external meatus.
5. Changes in the tissues over the mastoid.
6. Sagging of the postero-superior meatal wall.
7. Changes in the drum membrane.
8. Narrowing of the canal.
9. Blood examination.
10. Bacteriological examination of the aural discharge.
11. Roentgenograms of the mastoid.

Pain.—While not always a prominent symptom, it is in the majority of cases a very important one and should have careful consideration in every case, particularly if it continues after the first few days. Like pain in any diseased condition it varies greatly in different individuals. It depends on the adequacy of drainage, the extent of the mastoid involvement and the severity of the infection. In most cases it is over the mastoid or in the ear, at times radiating upward in the temporal or backward in the occipital region. It may be of a sharp or more often of a dull character. Frontal or temporal headache is not an uncommon symptom. Continuous unilateral radiating pain on the same side as the diseased ear is worthy of consideration. Continued pain, after free drainage has been obtained through the drum head, is an indication of mastoid involvement. I regard with special significance the occurrence of pain on cessation or diminution of the discharge from the middle ear. Undoubtedly pain is a more constant symptom and of more consequence in adult mastoiditis than in children. Absence of pain is not an indication that a mastoiditis is not present. I have not infrequently opened mastoids where a great deal of destruction had taken place but pain had been entirely absent.

Tenderness on Pressure.—According to their relative significance and frequency, Whiting enumerates four tender points: (1) antrum; (2) tip; (3) the point of emergence of the emissary vein; (4) the pre-mastoid lamina or posterior wall of the bony meatus. Tenderness is a very constant subjective symptom and when properly elicited and interpreted is of the greatest significance. Naturally it is more marked in the pneumatic type with thin cortex than in those of the sclerotic type

with thick cortex. I regard recurring tenderness of the utmost importance. In the early stages of acute otitis media tenderness of the mastoid may be present, and if drainage is adequate it usually subsides in two or three days. If it recurs and persists with free drainage, operation is necessary.

Temperature.—Temperature is a very variable symptom and is dependent to some extent on the underlying exciting cause, and we may have little or no temperature and still have an involvement of the mastoid. It is usually higher in infants and children. A recurrence of temperature with free drainage is significant of mastoid involvement and a persistent high temperature, providing drainage is free and no other cause is present, may be the only apparent indication for operation.

Discharge from the external meatus.—The great majority of cases of acute mastoiditis have a discharge from the external meatus. The amount, character and duration of the discharge are important. The quantity of aural discharge is not at the beginning of the disease significant but if it persists for five or six weeks, even in the absence of other symptoms, one must conclude that the antrum and mastoid cells are probably sharing to an appreciable extent in the infection and that the patient should be kept under close observation with the thought of establishing adequate drainage by surgical means. A bloody serous discharge continuing ten days or two weeks, particularly in the adult, is usually characteristic of a severe infection and bears careful watching. If the free drainage abruptly ceases, returning in a few hours or a day or so later, the patient's other symptoms meanwhile exhibiting no improvement, a mastoid involvement is to be apprehended. A profuse discharge continuing for over a week accompanied by other local and general symptoms, particularly if the latter are increasing in severity, are indications for surgical intervention.

This leads the writer to briefly consider the most important point in this discussion. How long are we to allow the aural discharge to continue in the absence of other apparent symptoms?

In children we frequently see dry ears and a normal functioning middle ear after weeks of discharge, but on the other hand, a great many become chronic with the attending dangers of serious complications, the menace of a focal infection and the certainty of impairment of the function of

the middle ear. A persistent discharge in adults is always of more consequence than in children, and a discharge continuing for three or four weeks, even in the absence of other symptoms, frequently accompanies destructive changes in the mastoid, which is demonstrated by roentgenograms and necessitates operation. In children we can often with safety wait a longer time. In many of these cases the suppuration is limited to the middle ear and Eustachian tube and removal of adenoids and diseased tonsils will often bring about a prompt cessation of the discharge. This is particularly true when the middle ear suppuration follows a simple nose and throat infection. Many of our leading otologists believe conservative treatment ought to be limited to three weeks. I do not believe that we can place a definite time limit, but I am sure that we are all agreed that a discharge continuing in children for over three weeks should be kept under close surveillance. Pulsating or pumping discharge in the early stage of acute otitis media is frequently present and is not at this time of particular consequence, but if it continues for two or three weeks, it is important and denotes at least antrum involvement and is then often associated with sagging of the postero-superior meatal wall and an operation is indicated.

Changes in the tissue over the mastoid.—Edema, redness and prominence of the auricle are relatively late manifestations of acute mastoiditis. In the early stages of acute otitis media, these changes are frequently seen but subside in a few days if adequate middle ear drainage is established. In infants and early childhood the changes are often due to the pus penetrating the cortex, producing a subperiosteal abscess. One must always eliminate diseased conditions in the external auditory canal in interpreting the condition. They are much more frequent in children than adults. In Bezold's mastoiditis the swelling is situated below the tip and frequently involves the soft tissues of the neck, caused by the pus penetrating the tip of the mastoid at the digastric fossa. In zygomatic mastoiditis (an involvement of the zygomatic cells) the swelling is high up, extending backward to the occipital and forward to the temporal regions. I have seen several of these cases and in a few was impressed with the relatively few other symptoms that they exhibited.

Sagging of the postero-superior meatal wall.—In the opinion of most otologists this is considered

a pathognomonic sign of mastoid involvement, demanding immediate operation. This symptom unaccompanied by other symptoms, I feel should not be considered too seriously. It can be caused by a filled up antrum which may drain through an adequate drum opening. I have repeatedly seen cases presenting prolapse of the drum clear up under conservative treatment. However, in most cases it is associated with other symptoms rendering the indication for operation comparatively easy.

Changes in the drum membrane.—The drum is usually perforated at some point, or is red, swollen and bulging. We do find an increased number of cases with the drum membrane intact. Here the membrane will not glisten like the normal. It has a dull appearance and the hammer handle will appear narrow. If the perforation is in Shrapnell's membrane it is indicative of an acute exacerbation of a chronic otorrhea. Polypi protruding through the drum opening, I consider an indication for operation. A great many cases of primary mastoiditis without apparent involvement of the middle ear have been reported. Dabney classifies the condition as idiopathic mastoid abscess. He says, "I wish the title to be understood as meaning an abscess in the mastoid process of the temporal bone without any immediately preceding or accompanying inflammatory involvement of the tympanum." Hempstead, of the Mayo Clinic, in a recent article on this subject, in which he reported three cases, says: "The term primary mastoiditis, as it has been designated in the literature, is misleading in such cases, since the infection must be primarily in the mastoid cells, and not secondary to an inflammation of the middle ear that has cleared up. It is possible to conceive of a blood-borne infection, after a severe local injury, as in osteomyelitis of other bones, although there is no more reason to expect such an infection in the mastoid than in other cavities, for example, the accessory sinuses. It is quite probable that some of these cases are latent suppurative otitis media, and not mastoiditis without involvement of the middle ear." He concludes that while the study of these cases does not permit definite conclusions, it indicates the existence of an antecedent otitis media without symptoms.

Narrowing of the canal wall.—In the absence of any inflammatory condition in the canal, this symp-

tom is particularly significant. It is, I believe, more reliable than any other one symptom. It denotes pressure back of the posterior wall.

Blood examinations.—They are not of much value in uncomplicated mastoiditis. A marked increased leukocyte count with an increased polynuclear percentage in conjunction with other confirmatory symptoms is an aid in diagnosis.

Bacteriological examination of the aural discharge.—Most observers regard bacteriological examinations of doubtful diagnostic value. The pneumococcus, Type III, formerly called the streptococcus mucosus, the streptococcus viridans or the streptococcus hemolyticus, are the most virulent and undoubtedly the direct cause of most of the cases of mastoiditis that require operation. I do not see how we can prognosticate from the organism found in the discharge the future course or severity of the disease, this being a question determined by a normal or lowered resistance and by the local diseased process.

Roentgenograms of the mastoid.—There is no doubt that the x-ray when properly taken and correctly interpreted, is in the majority of cases, an aid in diagnosis. Frequently it is the determining factor. I am conscious of the fact that a great many place little or no reliance on the x-ray. In some cases we have not always found what the x-ray apparently demonstrated, in others we were somewhat misled, but in the aggregate our findings corresponded and it has led us to adopt the procedure in all doubtful cases. We have seen many cases that we were convinced had mastoiditis but were unable to convince the physician, patient or parents that such a condition existed, where a roentgenogram verified the diagnosis. However, I much prefer to operate on the clinical symptoms.

Facial paralysis occurring during the course of an acute otitis is an absolute indication for immediate operation.

Gradenigo's symptom, a paresis of the sixth nerve, unless accompanied by other definite clinical symptoms, is not necessarily an indication for operation.

From the foregoing it can readily be seen that the discussion of this important subject is narrowed down to two questions: first, the question of the presence or absence of mastoiditis; second, when should we operate in mastoiditis?

In attempting to answer these questions, the

writer is led to the following conclusions based upon a careful survey of the literature of today and a personal experience in over three hundred cases.

1. Every acute otorrhea should be considered as a potential mastoiditis. The difference is largely one of degree.

2. The majority of cases of acute otitis media do not require operation before the third week because bone softening or decalcification usually requires about three weeks, depending upon the virulence of the infection, the resistance of the patient, the degree of tympanic drainage, and the type of the mastoid bone.

3. Relatively few serious complications follow acute mastoiditis in children caused by the ordinary nose and throat infections. Continued aural discharge in adults is of more serious import.

4. Early operations do not always prevent complications and too early operations may cause complications.

5. Most chronic ears follow the exanthemata (notably scarlet fever and measles), septic tonsillitis and influenza and it is in these cases, particularly following scarlet fever, that the writer urges early mastoid drainage, preventing what is otherwise inevitable, the menace of a discharging foci and the impairment of the function of the middle ear.

6. An acute discharge from the ear should not be allowed to continue for more than six or eight weeks at the utmost, if for no other reason than the impairment to hearing which is so likely to follow.

7. Inasmuch as the laws guiding us in the presence of a given group of indications have been well established for a number of years, only the physician in charge who observes the case from day to day can determine the presence or absence of mastoiditis and can decide the time of operation.

Treatment.—Treatment of acute mastoiditis may be considered under two heads: (1) the treatment of acute mastoiditis including the various abortive measures; (2) the securing of adequate drainage and the extirpation of all diseased conditions by mastoid operation.

Our first aim must of necessity include early and free incision of the drum membrane. If deemed expedient by the surgeon, this can be done under nitrous oxide or ether, or by instilling a few drops

of a mixture containing cocaine hydrochlorate, grains five to ten; alcohol, one dram; anilin oil, one dram.

The incision should be made at the bulging point, extending it upwards and backwards to the posterior meatal wall. This should be followed by a warm, weak antiseptic irrigation. One must remember that bulging of the drum membrane is relatively a late symptom of middle ear suppuration and we should not wait for its appearance before deciding to incise the drum membrane. If the incision is too small it should be enlarged. As a rule I am not in sympathy with repeated incisions because it must be borne in mind that it is not the partially healed incision with retention that accounts for the increase of symptoms, but often it is the increased tension put on the cells of the mastoid that are overfilled with pus, which, from mechanical hindrance, produces the pain, and the increased infection produces the temperature. Almost all the discharging ears that last through life can be traced to a spontaneous perforation. The patient should be put to bed, lying on the affected side, given a laxative, placed on a light diet and every attention given to the general condition. In the early stages an ice bag or heat may be employed. Personally, I prefer cold in the early stages, but the majority of patients, particularly children, are made more comfortable with heat. Politzer states that if the cold eases the pain, the continuation of the inflammation may be assumed; if it proves irritable and unpleasant, then disappearance of the inflammation is probable. Seldom is one obliged to administer sedatives to children. In young adolescents and the adult, I have no hesitancy in employing them, always bearing in mind the fact that the relief thus afforded may tend to mask the symptoms. In the early stages, gentle, warm irrigation with a saturated solution of boric acid, drying well afterward, is not only cleansing but often relieves the pain. After the first few days I favor the dry treatment, mopping the ears dry with cotton-wrapped applicators dipped in borated vaseline, followed by the insertion of a small piece of sterile gauze in the canal to facilitate drainage. The vaseline makes the application less difficult, anoints the canal, thus protecting the skin from the irritating effects of the discharge. Continued irrigations waterlog the drum and to some extent the middle ear, thus favoring suppura-

tion rather than retarding it. I am emphatically opposed to prolonged irrigation.

I realize that in small children, irrigation is more easily administered than mopping, but the former should not be overdone.

Suction is the most efficient means of draining the middle ear. It should be gently and lightly applied two or three times daily.

In children, I doubt the efficacy of any medication to the nose and throat. Many of these children, particularly if they have been susceptible to nasal and throat infection, do splendidly on cod liver oil.

In the Vienna clinics, heat in the form of light, using a high power electric bulb with a condenser, is being universally used, not only in cases of acute otitis media but in early mastoiditis, with most gratifying results. The light is held close to the retro-auricular region from forty-five minutes to one hour the first day, one and one-half hours the second day, and from one and one-half to two hours daily thereafter, preferably half of the time in the morning, the remaining time in the afternoon. I have seen acute otitis media of several weeks' duration clear up very quickly and in acute mastoiditis where operation was apparently indicated, cure was effectively produced in many instances. This form of treatment, too, is very valuable in slow healing wounds following operation. I cannot recommend this valuable adjunct in treatment too highly. There can be no doubt that some of the continuous discharging ears are simply tuborrrhea, the suppuration being confined to the Eustachian tube. This usually responds promptly to removal of nasal conditions, especially the removal of adenoids and diseased tonsils and the correction of the nose-blowing habit. The latter, I feel certain, is responsible for many of our acute and chronic ears. There is too much blowing of the nose. These patients should be instructed to blow the nose without closing either nostril.

I am not an advocate of tonsil and adenoid surgery in the early stage of acute otitis media.

Protein therapy and autovaccinotherapy have not shown the results expected and probably yield their greatest influence in post-operative cases.

Operation.—The technique of the classical simple mastoidectomy, you are all familiar with and requires no elaboration. A sufficiently wide opening made into the antrum to provide adequate

drainage and the careful, clean removal of all diseased cortex are the essential features of the operation. Early healing of the mastoid wound favored by the so-called blood-clot method (the immediate closure of the post-auricular opening) or the removal of drains as early as is compatible with safety are the additional important essentials. The immediate closure of the wound is contraindicated in complicated cases or where the dura or sinus has been exposed.

In these cases we should always remember the law of surgery, namely, that wounds in the process of normal and healthy repair should be subjected to the least possible mechanical disturbance. All dressings should be as light as possible. The outer dressings should be changed in twenty-four hours and daily thereafter. The drain should not be disturbed for four or five days and then gradually removed so as not to disturb the granulations. All bandages should be removed as soon as possible. If the wound shows a great deal of reaction, nothing has given us as much satisfaction as hot, wet boric acid dressings. We have encountered such cases particularly following scarlet fever. I am convinced that the use of wet dressings in this class of cases has been generally neglected. Later on if healing is slow the wound should be exposed to the air and sunlight or radiation.

Causes of failure necessitating a second operation are generally due to too early operation or because diseased cells have been overlooked either in the tip or the zygoma.

In Minnesota in 1921, there was one death in every two hundred and twenty-eight, due to ear diseases. There were twenty-seven deaths attributed directly to mastoiditis.

When we recall that between one-fourth and one-half per cent of all deaths are due to ear diseases, and that between one and two per cent of our population have chronic running ears, I hope that this subject will receive the attention that it so justly deserves.

PLURIGLANDULAR PRODUCTS OF HARROWER

In 1919, the Council on Pharmacy and Chemistry examined a number of the products of the firm of Henry R. Harrower, Glendale, California. It found none acceptable for New and Non-official Remedies. An examination of the "literature" sent out by the firm during the last year shows that its business is still largely in complex mixtures such as those reported on adversely by the Council.—(*Journal A. M. A.*, Oct. 4, 1924, p. 1098.)

FRACTURES OF THE HIP*

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Fractures of the hip occur at all ages, but are most common in elderly persons. The term, in its broadest sense, may include fractures through the trochanter, but I shall discuss here only those through the neck of the femur, just below the head (sub-capital), through the narrow part of the neck, or at the juncture of the neck and the trochanter. Dislocations of the hip are rare; they occur in persons in the more active period of life, from twenty to fifty years of age. Epiphyseal separations occur generally in children under fifteen years.

The hip-joint, one of the ball and socket type, is firm and stable, owing to the generous depth of the acetabulum, which is increased by the strong cotyloid ligament, to the heavy musculature, and to the fan-shaped arrangement of the muscles, and their insertion close to the joint. Weight-bearing is also a prominent factor in the stability of the hip. The capsule is greatly thickened in certain portions to form strong ligaments, well illustrated by the Y or the femoral ligament on the anterior aspect.

The architectural plan of the neck of the femur shows nature's attempt to strengthen this bridge of bone that is subjected to so much strain. The under part of the neck is the thickest. The elderly person's bones are atrophic and more brittle, and hence give way more frequently than those of the younger person. A cross section shows a system of finely formed bony arches, Gothic in type, thrown across from side to side.

A fracture of the hip is intra-articular, and the synovial fluid that bathes the fractured surfaces of bone is an inhibiting factor in the formation of callus. Delayed union, in the ordinary sense, does not occur in fractures of the hip. The fracture either unites or becomes a case of non-union in a comparatively short time. The proximal fragment is devoid of muscular attachments, and its only source of nourishment is the ligamentum teres and the joint fluid. The capsule of the joint has no

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attachment to the proximal fragment, except in rare instances in fractures near the trochanter, when there may be a small attachment on the posterior surface. It is apparent that practically all of the reparative process will have to come from the distal fragment. It is very evident also, that in the reduction and setting of such a fracture, the muscular spasm will all be exerted on the distal fragment, and this fragment will have to be manipulated and brought into contact and correct alignment with the upper or proximal fragment. The capsule is strong and reinforced in parts, forming ligaments, and portions of it may, in rare instances, get between the fragments. If this occurs, non-union may be the result in spite of careful and painstaking treatment. When reduction is not satisfactory, open operation should be resorted to. In two instances a few weeks after injury and at-

close to the head and form the group formerly strictly called the intracapsular. On the other hand, if the fracture occurs through direct violence, as the result of a fall on the trochanter, the break is usually through the trochanter, or at its juncture with the neck. In this type a better prognosis may be given than in the sub-capital type, owing to the fact that there is better circulation in the proximal fragment, because of the capsular insertion into it and because usually the patients are younger and in better general condition. When the fracture is through the trochanter, union always occurs, although the position may not be of the best. The only exception I have ever seen was in a case of syphilis of the central nervous system. The signs and symptoms, if the fracture is sub-capital or near the trochanter, are the same, and the differentiation can only be made by aid of the x-ray.

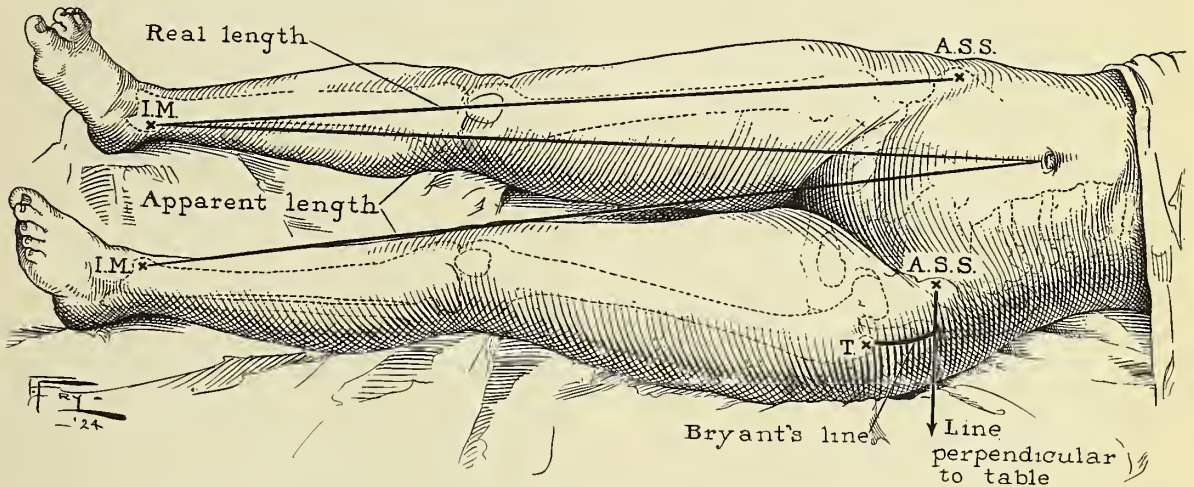


Fig. 1. Measurements used to determine presence or absence of shortening.

tempt at reduction elsewhere, we found the fragments slipped by each other. Clearly under such conditions open operation is necessary.

The Y, or ilio-femoral ligament, is of aid in the reduction of a fracture.

When a reduction is made, and the hip is placed in abduction and extension, this strong ligament becomes taut and acts as a sort of splint in forcing the fragments into alignment, just as do the triceps muscle and tendon in the reduction of supra-condylar fractures of the elbow joint. The exact method or manner of sustaining the fracture varies. Frail, elderly persons may sustain fractures through indirect violence, the fall coming as a result of the break. Such fractures are usually

Disability, even without much pain, following an elderly person's fall on the hip should render the surgeon wary, and unwilling to make a diagnosis of sprain and contusion unless a thorough x-ray examination fails to reveal a fracture. The outstanding subjective symptoms are (1) disability following a fall, and (2) pain of varying degrees on attempted manipulation, or when the limb is used. Instances are not uncommon of the patient's being able to walk for some distance because of the stability of the impaction. The objective symptoms are of more importance: (1) eversion of the leg and foot, (2) shortening of varying degrees, (3) displacement of the trochanter to a posterior plane, always accompanied by eversion of

the foot. (4) crepitus on manipulation, (5) slight swelling and often local tenderness of the hip-joint manifested on palpation, (6) inability, except in firmly impacted fractures, to lift the heel from the bed or table while the knee is extended, and (7) a good x-ray plate or film. The last mentioned will definitely establish the diagnosis, and render unnecessary the manipulation to elicit crepitus.

The absence of the classical clinical signs of fractures of the hip may lead one into the pitfall of mistaken diagnosis if the fracture is well impacted. Time and again have patients presenting themselves with non-union in the hip-joint stated that at the time of the accident their physicians had examined them carefully, measured their legs for comparison of length, then manipulated for crepitus, and because of the absence of these signs had insisted that there was no fracture. Months later, when prolonged disability had demanded further consultation, much to the chagrin of the attending physician, shortening and crepitus had been found, and x-ray examinations had clearly revealed a fracture. The explanation is that there had been good impaction at the time of the accident, but as no fixation was provided, the impaction had broken down. Such cases emphasize the necessity for re-examining at intervals, as one would a patient seen for the first time, if he does not make the recovery anticipated. Measurements are important, and it may not be amiss to emphasize the different ways of accurately taking them. The "real" length is recorded by measuring from the anterosuperior spine to the internal malleolus on both sides. The "apparent" length is obtained by measuring from the umbilicus to the internal malleolus on both sides (Fig. 1). Difference can be made in the apparent length by the patient, by simply tilting the pelvis, but this discrepancy is readily detected by measuring for the actual length. When there is real shortening due to a fracture of the hip, the top of the trochanter will ride above Nelaton's line, an imaginary line drawn from the anterosuperior spine to the tuberosity of the ischium. Also the length of the so-called Bryant's line may be shortened (Fig. 1). This line is obtained by dropping a perpendicular line from the anterosuperior spine to the table with the patient lying on his back. The distance between the top of the greater trochanter and this line will be shortened on the affected side.

We must beware of placing our trust in impaction. Undoubtedly impacted fractures of the hip do sometimes unite firmly with little or no treatment. As I have stated, in a large number of our cases of ununited fractures of the hip a diagnosis of fracture was not made at the time of the accident because there was no appreciable deformity and no shortening demonstrated. In others the treatment had been indifferent and unscientific, carried out more as a ritual, and consisted in applying an ordinary Buck's extension, a long side splint, sand bags on each side of the leg, and so forth. There must be a comprehensive understanding of the pathologic condition present, knowledge of the type of tissue being dealt with, and of the simple mechanics necessary to correct



Fig. 2. Recent fracture of the neck of the femur before reduction.

the deformity. The means to attain the end desired, namely anatomic restoration of the injured part and the fixation in that position until union occurs, may vary according to the method of the surgeon. However, when such surgeons as Royal Whitman and Willis Campbell have had the opportunity to treat a large number of patients with a high percentage of excellent results, it behooves us to follow their teaching and practice their methods, unless circumstances prevent us from so doing, or we have something better to offer. I believe that the abduction method, as advocated so strongly by Whitman, and practiced so successfully on a large number of patients by Campbell, is the

method of choice and should be thoroughly understood by all who undertake the treatment of this serious type of fracture (Figs. 2 and 3). The old belief that the majority of fractures of the hip-joint fail to unite is in the discard, and not to be countenanced in modern surgery. On the other hand, to say that treatment of this sort should be accorded all fractures of the hip is unreasonable. We are all occasionally confronted with the feeble old woman or man of seventy, eighty, or ninety years, whose reserve is almost at the zero point. They are senile, and cerebral arteriosclerosis is advanced. They cannot stand any confinement, and the only thing to do in such a case is to treat the patient and not the fracture. In the past there was too much of a tendency to treat the patient

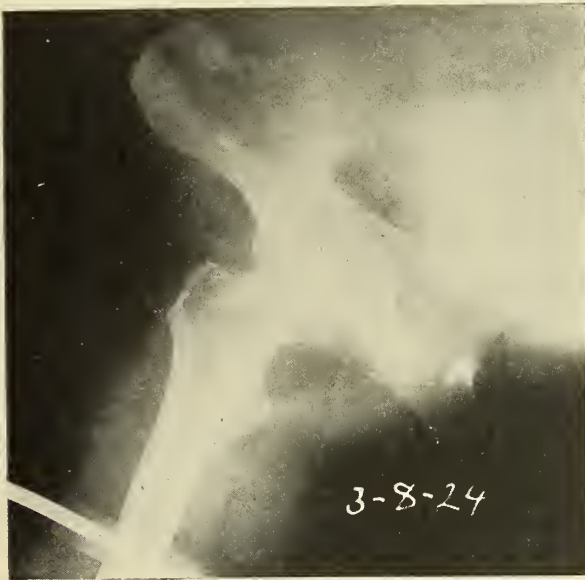


Fig. 3. Same case as Figure 2 after reduction.

and not the fracture because of the impression entertained both by the profession and the laity that treatment was futile, but in the light of our experiences we now strike a better balance.

The diagnosis of non-union of the hip-joint needs no discussion. The prolonged disability, the shortening, with tendency to eversion of the leg, and, usually the inability to raise the heel from the bed or table with the knee extended, are the cardinal signs. The x-ray discloses the typical lack of union with varying degrees of absorption of the neck. The foot should be in the upright or inverted position when the x-rays are made or there

will appear to be a greater degree of absorption of the neck than really exists.

The treatment of a recent fracture of the hip may be undertaken with confidence, unless the patient is too old or feeble to stand confinement. When possible, the patient should be placed in a hospital, but this is not always done. The emergency is just as great as in most abdominal disorders, and yet a patient with a fractured hip is treated in the home, whereas a patient with an abdominal lesion is rushed to the hospital. Under an anesthetic and preferably on a fracture table, the impaction should be broken up, the leg pulled down to normal length, and the hip swung out into full abduction with the foot in inversion. This reduction is usually readily accomplished, the abduction and inversion maintaining securely the correct anatomic reposition of the fragments. Abduction is checked only by the impingement of the trochanter and its tissues against the wall of the pelvis. Also in this position, while the limb is in extension, the ilio-femoral ligament is tightened, which steadies the fragments. In our hands a double plaster-of-Paris spica cast has been very efficient in maintaining this reduction, but any other agent that answers the purpose may be used. Extension in the abducted position by weight and pulley, or by the Thomas extension splint with means to maintain abduction and inversion, can be used, but the frequent attention necessary is decidedly against either. Bradford has reported several excellent results following the use of his abduction hip splint, primarily designed for the treatment of disease of the hip-joint. I have used it in a few instances as a splint applied after the cast has been worn for from eight to ten weeks. In Minnesota, due to the teachings of the late James E. Moore, the Ruth Maxwell traction method has become more or less popularized, and when properly applied with a full understanding of what is being done, it also affords good results. The chief argument against it is that it requires attention to keep it working properly. That the Whitman method gives good results is shown by the careful report of Willis Campbell, who, in an article based on 160 fresh fractures of the hip, carefully reports his results. Twenty-one patients reported for examination several years after dismissal, but of these, sixteen (75 per cent) had solid bony union, and 90 per cent had good functional results, certainly a different

story from that told by the older practitioners that non-union is to be expected in fractures of the hip.

When non-union exists the patient must either be satisfied with a fibrous union, which in some instances is more satisfactory than might be expected, or have some form of reconstruction operation to bring about union of the fragments or to give bony weight-bearing contact of the femur on

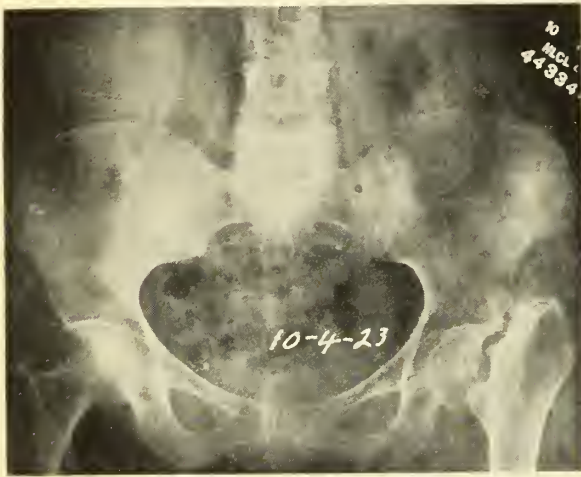


Fig. 4. Non-union of hip with absorption of neck.

the pelvic wall, and thus stability. Each case should be studied separately as to whether or not operation should be undertaken. The age, general condition of the patient, as well as the local condition of the fragments as to the amount of neck left, the viability of the head, and so forth, should all be carefully considered. When possible, after the fragments have been exposed and freshened, the bone pegging or grafting operation is the one preferred because it leaves the anatomic relations more nearly normal. As a rule, the results in patients who have had non-union for a year or less are better than in those who have had it longer. For some time it has been our custom to use the fibula as the graft or peg rather than a piece of the tibia. It is larger and stronger, and the patient never misses it if it is taken out 3 or 4 inches above the external malleolus. Of thirty-six patients operated on by the bone pegging method, twenty-two (61 per cent) obtained bony union.

When the absorption of the neck is almost complete and the fibrous union is inadequate to give a serviceable leg, there are two types of operation to be considered, the Brackett operation and the

Whitman operation. The Brackett operation consists in freshening the surfaces of both fragments and reconstructing the neck of the femur by moving the trochanter with its attached muscles to a lower level on the femur. The denuded end of the distal fragment is put in firm apposition to the raw freshened surface of the head. The hip is then put in the fully abducted position in a plaster-of-Paris cast. The Whitman operation has as its base the removal of the head of the femur and the placement in the acetabulum of the reconstructed neck of the femur as described (Figs. 4 and 5). Each has certain advantages, and in certain patients, if the pain is extreme and the disability great, other things being equal, one of the two latter operations may be undertaken.

SUMMARY

While fractures of the hip do not give the high percentage of good results that other fractures do, they nevertheless respond well to treatment. They should be reduced and held in position until healing occurs, at least three months, with no weight bearing for at least six months. The abduction method, advocated by Whitman, has a sound basis. The teaching that non-union is to be expected is in the discard. Careful examination checked up by measurements and x-ray examinations at the time



Fig. 5. Same case as Figure 4 after Whitman reconstruction operation.

of injury will prevent many mistakes. Re-examination clinically at frequent intervals, if x-rays are not made, will reveal the case in which the impaction breaks down. In case of non-union, the bone pegging operation, preferably using the

fibula, is the most efficacious. When the neck of the femur is practically gone, the reconstruction operations of Brackett and Whitman should be considered. It should be remembered, however, that firm fibrous union in some instances is quite adequate for the demands of function in the declining years of life. Each patient with non-union of the hip presents a problem that can only be solved by individual study.

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DISCUSSION

DR. EMIL S. GEIST (Minneapolis): Fracture of the neck of the femur is one of the most serious fractures we have to deal with. The percentage of non-union is still far too high and does not compare at all with any other type of fracture; this even in the face of the Whitman method of treatment, which is pretty well acknowledged to be the best we have to offer up to date in fresh fractures.

The x-ray—even the stereoscopic Roentgenogram—often leaves us in doubt as to whether or not we have achieved that so absolutely necessary desideratum—perfect apposition of the fragments. For without perfect apposition there will be trouble later; either non-union, or a painful hip. We, all of us, have seen cases develop non-union even

when, to judge from all clinical and Roentgenographic evidence, there does exist perfect apposition.

Surely, there must exist some other cause of non-union in this particular kind of fracture besides lack of skill of the physician. Do we not see union the almost universal result in all other fractures, no matter how little the degree of skill employed?

I believe we must look to the synovial fluid for the intrinsic cause of most non-unions of the femoral neck. Witness the old lady of 75 or 80 who breaks the neck of her femur. Personally, I have quit worrying about non-union occurring in her case if she survives the so frequent immediate sequelæ of her fracture (pneumonia, general asthenia, etc.). I have now 8 or 9 such cases, all of whom achieved union—without any treatment excepting rest in bed. Why? I believe it is because there is in these old folks less synovial fluid to interfere with the proper activity of the osteoblasts.

That is why I believe absolute apposition of the fragments is more necessary here than in other types of fracture, i.e., to get away, if possible, from the deleterious effects of the synovial fluid.

Those of us who see many fractures will recall the frequency of non-union in other bones bathed in synovial fluid (head of radius, carpal bones). This idea is by no means original—Cotton has voiced it and others before him.

Absolute apposition is therefore more desirable here than anywhere else in the body. How to achieve it:

Baer, of Baltimore, at the last meeting of the American Orthopedic Association, practically announced his intention of cutting down on all of his (operable) fresh fractures of the neck of the femur and pegging and nailing them because then, as he said: "He knows he has the fragments in apposition and he knows he keeps them there."

I believe that Baer's statement is worth pondering over, for we must adopt some different, radical departure from the methods in vogue today if we are to reduce the percentage of non-union in this so frequent and grave type of lesion.

THE STANDARDIZATION OF DRUGS AMID CHANGING STANDARDS

Medical welfare is hampered in many ways by the machinations of the quack and the health impostor; likewise by the production and distribution of products that are below standard or utterly incapable of accomplishing what the unsuspecting user, be he layman or physician, may rightfully expect of them. Much of the valuable work of the Council on Pharmacy and Chemistry of the American Medical Association consists in revision—in promoting an up-to-date attitude toward well tested novelties in drugs, while preserving a justifiable conservatism toward the valuable contributions of the past. An illustration of the diffi-

culties encountered is afforded by the recent experiences with cod liver oil. The product itself is no novelty, but some of its reputed virtues have been put on a more scientific basis in the last decade. The pharmacopeial standards have been found insufficient. Today it is standardized on its vitamin potency—and more recently on its antirachitic properties. Such tested cod liver oils are widely advertised and have been accepted for inclusion in New and Non-official Remedies by the Council on Pharmacy and Chemistry. Those who believe in keeping abreast of progress should, therefore, lend their enthusiastic support to agencies, such as the council, that labor unselfishly for them.—(*Jour. A. M. A.*, Oct. 4, 1924, p. 1080.)

SOME PHASES OF EPILEPSY*

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Until recent years epilepsy has been described as a disease characterized by recurrent attacks of convulsions associated with unconsciousness. Many allied conditions have been gradually added, and at present epilepsy is considered merely as a syndrome of some underlying disorder. The old theory that the epileptic convulsion is *always* produced by an explosive discharge of the motor cells of the brain cortex has long been abandoned. This was based mainly on the fact that electric irritation of the cortex produced convulsive seizures. Two other theories have been advanced as to the location of the convulsive site, namely, the combined cortical and subcortical theory, and the medullary theory (Pollock¹). Mingazinni² and others have demonstrated that convulsive seizures are produced in birds by hemorrhage in the pons. Similar observations have been noted in man. Nothnagel believes that general motor irritative phenomena may arise from lesions of the pons alone, while Bechterew states that these are due to indirect irritation of the motor area of the cerebral cortex. However, in decerebrated animals, irritation of the pons produces convulsions, in which the clonic component frequently is absent. On the other hand, Grünwald³ and others have produced typical convulsions in decerebrated dogs and cats by picrotoxin injections. Many similar interesting observations are recorded in the literature. However, no definite location in the brain has as yet been established, which could be termed the convulsive center and which initiates the seizure. It would seem that epileptogenic qualities are possessed by the ganglion cells both of the brain and the brain stem, and that irritation of these cells at any level may produce convulsive attacks.

Fully as interesting and confusing are the various theories advanced as to what makes the individual prone to these periodic convulsions. Toxic factors, both exogenous and endogenous, are given due consideration. Among the former, alcohol heads the list. Endogenous toxins may be pro-

duced locally by the breakdown of cortical tissue in disease, such as arteriosclerosis, general paresis, and other degenerative cerebral disorders. Biochemical substances and endocrine disturbances entering the blood stream are further cited as causative agents. Buscaino⁴ believes that abnormal proteins in the thyroid play an important rôle in many cases of so-called idiopathic epilepsy, and that the convulsions are simply anaphylactic crises. He has demonstrated these proteins in the colloid substance of the thyroid in 71 per cent of epileptics (396 cases) and in only 14 per cent of non-epileptics. He recommends thyroidectomy for these patients. In a study of 128 cases of epilepsy presenting some endocrine disturbance, Patterson⁵ noted evidence of pituitary involvement in an overwhelming majority. Sargent⁶ emphasizes the vascular theory and believes that the vascular disorders produce localized cerebral anemia, which initiates the convulsion. These disorders are due to a disturbance of the sympathetic-autonomic control of the cerebral cortical vessels. Attempts are made to explain traumatic epilepsy on a similar basis. The adhesions between the skull and brain produce traction, if the brain is pulled upon, causing a localized constriction of the cerebral blood vessels and resulting in a localized anemia which precipitates the convulsion. However, in a study of 610 cases of head injuries Holmes and Sargent observed traumatic epilepsy in only 6 per cent, while in a series of 18,000 cases of gun-shot and other head injuries occurring in warfare only 4.5 per cent of epilepsy was noted by Wilson.⁷ Because of this, Wilson hesitates to say that a single case of epilepsy has been caused by a head injury, but feels that the determining agent is an inherited constitutional predisposition to nervous irritability and epilepsy.

In 1917 Terhune⁸ and Reed⁹ published articles on the bacteriological theory of epilepsy. Their findings have not been substantiated by other investigators and were never seriously considered. In recent years L. Pierce Clark¹⁰ suggested the psychogenic factor as a causative agent. He believes that epilepsy is the result of a peculiar personality defect which is constitutional. The epileptic, due to his inability to properly adjust himself to his life's responsibility, reacts by a convulsive seizure. In this way he attempts to escape from distressing situations and unpleasant en-

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vironments. This theory is an interesting one from the psychogenic emotional viewpoint.

Probably the most important causative factor in epilepsy is acidosis (Osnato¹¹). This may depend on a viciously functioning carbohydrate metabolism, causing a general toxicosis, or upon the local production of the toxic substance from disintegrating cellular structures secondary to vascular disturbances. Cuneo has experimentally demonstrated that toxic substances are liberated in the blood by a defect in the alkalization function of the small intestine and liver in the process of carbohydrate metabolism. These toxic substances are capable of causing convulsions when they reach the brain.

The classical syndrome of epilepsy is the grand mal or petit mal attack. However, all its other manifestations are fully as characteristic and significant. Douglas Thom¹² has called attention to the relation between infantile convulsions and the chronic convulsive disorders of later life. In a group of 300 cases studied at the Monson State Hospital for epileptics, 50 per cent had their first convulsion prior to the fourth year. From the records of the Massachusetts General, the Infants' and Children's Hospital, Thom collected 111 cases who had convulsions during the first three years of life. None of these cases were associated with any acute or chronic cerebral condition, birth trauma, or other brain damage. The convulsions occurred with gastro-intestinal disturbances, acute infections, spasmophilia, pertussis, and rickets. In 11 cases no associated disease was noted. Out of these 111 cases 62 patients, or 56 per cent, continued to have convulsions until the time of death, or are having convulsions at the present time or are mentally deficient. Of 29 cases diagnosed as spasmophilia, 16 are similarly affected. These statistics are of special importance when we consider the usual attitude of the general practitioner, and even the pediatrician, toward infantile convulsions. Patrick and Levy¹³ believe that convulsions in infancy and childhood not epileptic, spasmodic or symptomatic of a gross brain lesion, are evidences in themselves of the individual's increased chance of later epilepsy. They¹⁴ further emphasize the importance of slight attacks in young people, such as a transient dreamy state, a momentary stare, a causeless stop in play, a sudden bobbing of the head, a drop to the floor, the youngster at once jumping up, etc.

Similar recurrences are highly suggestive. An occasional nocturnal enuresis, a subconjunctival hemorrhage occurring during sleep, a sore tongue or a confused feeling upon awakening, a small amount of blood on the pillow without demonstrable cause are sufficient evidence to warrant careful observation for nocturnal epilepsy.

A little youngster five years old who had been diagnosed spasmophilia because of three convulsions at the age of two, was referred to us because of nocturnal enuresis occurring about every six weeks during the past eight months. The parents were instructed to have the patient sleep in the same room with them, and about two weeks ago the father was awakened by a grunting noise and found the little youngster in a grand mal attack. Another very interesting observation was that of a bank clerk, aged 23, who consulted us August 15, 1922, because of increasing difficulty with his bookkeeping. His family and personal history were negative except one sister who was under our care for idiopathic epilepsy. He stated that in the spring of 1922 he first noticed that occasionally after a good night's sleep he would feel confused and drowsy. During that day he was unable to concentrate, would make errors in his bookkeeping, lacked interest in his work, and seemed unduly irritable and fault-finding. This was followed by a good night's rest, after which he seemed perfectly normal for a week or so. These distressing periods gradually became more frequent, and about August 1, 1922, he lost his position because of his many errors and general inadaptability. His sister stated that he was becoming very irritable and unreasonable. His neurological examination was negative. He answered questions promptly, but in a rather sullen, resistive manner. He added and multiplied small examples correctly, but seemed confused and made errors when confronted with larger problems. A tentative diagnosis of incipient dementia precox was made, and under a reconstructive regime and rest he gradually improved. After three months he was able to resume his work. His former difficulties soon recurred and he was advised to secure outdoor occupation. About this time one of his sisters residing in a neighboring state informed me that some years previous she had suffered from a condition similar to her brother and that she had been diagnosed nocturnal epilepsy. She made

marked improvement since taking luminal. She requested the same treatment for her brother. He was given two grains of luminal at bedtime and put on a non-stimulating diet. He has made very satisfactory progress and for the past year has been entirely free from his periods of confusion. He is alert and able to fill a responsible position. His irritability has subsided. Although we were unable to obtain any history of epileptic attacks, the irregular periods of confusion, the definite benefit from luminal, and the family history strongly suggest a nocturnal epilepsy.

Epileptic equivalents, especially psychic manifestations, are always interesting and frequently most difficult of diagnosis. Explosions in the mental sphere may manifest themselves in the various forms of psychosis. Furthermore, epileptics present definite mental changes in the course of their recurrent attacks. According to Lewandowsky,¹⁵ these develop in about 85 per cent of all cases. Brill¹⁶ in his recent textbook of psychiatry groups them into three classes, according to the degree: (1) epileptic character; (2) epileptic psychopathic constitution; and (3) epileptic dementia. These patients are frequently unduly irritable, impulsive, moody, passionate, and easily stirred to emotionalism, particularly of a religious nature. Their affectivity reacts in a morbid manner, in that an existing effect lasts a long time and it is difficult to divert it by new impressions, either pleasing or distressing. In many cases psychic functions are markedly retarded and intelligence is below normal. As the seizures recur over a period of years, memory impairment and other evidences of beginning mental deterioration frequently develop.

Epileptic insanity may manifest itself in the most varied forms of psychosis. Mania, melancholia, delirium, stupor, confusional states, paranoid syndromes are all types which may occur on an epileptic psychopathic constitution. Bruce,¹⁷ however, objects to the term epileptic insanity, and believes that the insanity associated with epilepsy is merely an accident.

The psychic equivalent frequently has the same characteristics in its mental explosion as the grand mal seizure, namely, a sudden onset, a rapid subsidence, and no recollection of what occurred during the attack. This is particularly true of the acutely maniacal type and is well illustrated by the following case:

A man, aged 42, was admitted to the neurological service at the Ancker Hospital, November 12, 1922. His friend gave the following history: About 5 P. M., while walking along the street engaged in a friendly conversation, the patient suddenly became violent and excited. When attempts were made to restrain him he became very noisy, attempted to bite and strike his friend. He was overpowered and brought to the hospital in the police ambulance. It was necessary to put him in full restraint, and with the aid of morphine hypodermically he passed a fairly quiet night. Early the following morning, upon awakening, his acute excitement reappeared. He was noisy, abusive, profane, attempted to break his restraints, and talked in an incoherent manner. In about four hours the maniacal condition gradually subsided, but the confusion continued for about two hours. By noon he was apparently normal, requested to be taken out of restraint, inquired as to where he was, how he was brought to the hospital, etc. He had no recollection of what had transpired, but remembered that he had been walking on Sixth Street in the morning with his friend. He was able to give a clear, concise history. His family history was negative. He denied alcohol and venereal disease. For the past twenty years he had been subject to attacks of epilepsy, grand mal type, averaging about ten seizures a year. He had experienced two acutely maniacal attacks similar to the present one. They occurred two years and nine months ago, respectively, and were of about twenty-four hours' duration. He has no recollection of these, but described the attacks from information he received from his friends. The neurological examination was negative. All laboratory tests were normal. In the absence of any other causative factor and with a history of epilepsy, these three acutely maniacal attacks were evidently epileptic equivalents.

Sometimes these sudden mental explosions assume very serious forms and patients commit impulsive acts. This should always be borne in mind when an unusually brutal crime is committed or when an epileptic gets in conflict with the legal authorities because of some unexpected indiscretion against the social order. A young boy, aged 19, devoted to his mother, who was his constant companion, had frequent grand mal attacks. During the interval he seemed apparently normal. On one occasion, while enjoying a meal with his mother, he suddenly grabbed the bread knife, attacked her, and painfully injured her. About six months later, while both were reading, he suddenly jumped up and struck her with the reading lamp. Both of these attacks were of short duration. He had no recollection of what had happened, but manifested great anxiety lest they should recur. He also showed evidences of beginning mental deterioration, a slight memory impairment, and emotional instability.

It is quite characteristic in these epileptic equiva-

lents that the patient has no recollection of what occurs during the attack. Rarely, however, one encounters a case in which the individual realizes what he is doing, but is unable to exercise sufficient control to govern his actions.

A male, aged 18, was referred to me by Dr. W. C. Roberts, Owatonna, Minn., with negative family and personal history except that he has had grand mal attacks for the past six years, averaging about one a month. During the past year he would develop peculiar mental disturbances during which he would threaten to kill himself and the family, would break furniture, etc. During his ten weeks' stay at the hospital he had three such attacks. Without any apparent reason he would suddenly become sullen and depressed, refuse to stay in his room, wander about the hospital and make insulting remarks to the nurses. In one of these attacks he got into an automobile and attempted to start it. When asked to come out of the car and go to his room he became very profane and threw his cap and coat on the ground. After considerable persuasion he finally went to his room. When asked to undress and go to bed he stated that he was unable to make himself do this, that he was getting one of his ugly spells and that he could not control himself. He finally went to bed, but within a short while became noisy, unruly, pounded on the radiator with the soap dish, rattled the door, etc. He finally threatened to harm himself and the nurse. As he became more disturbed it was necessary to put him in restraint. He broke these, smashed the window and the water pitcher, was again put in restraint, gradually quieted down and fell asleep. He awakened the next morning apparently normal and apologized for his actions. He remembered every detail of what had happened. The duration of the attack was about fifteen hours. These attacks bore no relation to his grand mal seizures. In the interval he was normal and a very pleasant and co-operative patient. Because of these dangerous, recurrent attacks, it became necessary to commit him to a hospital for the insane.

Periods of depression, with all the features of a melancholia following an epileptic attack, are not infrequent. They differ somewhat from a true melancholia in that the depression is not so profound nor the state of inhibition so characteristic. Occasionally this condition is observed for a short time prior to the convulsive seizure. The following case is of this character and not only illustrates the depression but also an unusual and prolonged aura:

A girl, twenty years of age, came under observation because of peculiar attacks. Her family and personal history were negative. During the middle of one afternoon she suddenly became quite depressed without any apparent cause. She felt like crying, everything seemed gloomy, and she was very discouraged. The feeling of depression continued and she refused to eat her supper. While retiring, a sudden fear of impending danger came over her for about twenty minutes and then gradually subsided. She began to feel dizzy and attempted to sit up in bed. A small

marble statue of a beautiful person appeared in the room before her. It grew larger and larger, and finally floated toward her, as if it would crush her. She screamed for help, and by the time her sister had rushed upstairs to her room she had entirely recovered. About one month later she had a similar experience, which was followed by a generalized convulsion with involuntary urination. Within six weeks she developed another similar attack.

When one is unable to obtain any previous history of typical grand mal or petit mal it is sometimes quite difficult to arrive at a definite diagnosis of an epileptic equivalent. However, if one recalls the characteristics of this syndrome, namely, a sudden onset, no recollections of what occurs during the attack, and a rapid subsidence of the mental disturbance, frequently followed by a profound sleep, a fairly accurate diagnosis can be made. The following report with a most interesting mental picture is a fairly typical case:

A schoolboy, aged 10, was referred to me by Dr. Meyer, of Melrose, Minn., April 4, 1924, because of an acute mental disturbance. His family history was negative except that a maternal aunt had epilepsy and died in status epilepticus. The mother, a brother, and the patient talked frequently in their sleep, sometimes the greater part of the night. The patient's birth had been normal, and nothing of importance could be obtained in the personal history. Three years ago, while talking to his grandfather, he suddenly screamed, his expression became terrified for about one minute and then became normal. One year later he had a similar attack. On March 17, 1924, while picking up some grain in the barn another boy brought in a rope and told our little patient that unless he worked faster he would hang him, and proceeded to put the rope around the boy's neck. He became terrified and screamed. Within a minute he stiffened out. The mother, hearing his scream, rushed to the barn and found the youngster unconscious and rigid. He recovered in a very short time. After four hours he again met this boy and had a similar attack. After regaining consciousness he was confused, but was able to attend school the following morning. About two weeks later he had similar attacks, as many as three a day. These could be brought on by frightening or scolding him. In the interval he seemed normal. On April 2nd he appeared somewhat confused, acted terrified, requested his mother to remove the pictures of dogs and other animals from his room, because they frightened him. This condition continued until he was brought to my office. While there he would have periods during which he seemed terrified, and evidently had distressing hallucinations of sight, for he would cover his eyes and hide in the corner. At other times he became violent and would bite and scratch whoever attempted to restrain him. This continued for about one hour. During this time he had a short period during which he was quite rational and answered questions promptly and correctly. He was taken to Mounds Park Hospital and within an hour or so the attack subsided and he seemed normal except for some confusion. A diagnosis of epileptic equivalent was made. He was placed

on luminal and under hospital regime gradually improved. While at the hospital he had one generalized convulsion of short duration and several attacks during which he would suddenly fall, be dazed for a minute, and recover. The severity of these mental explosions gradually lessened. One day while visiting with him, his pupils suddenly dilated, his expression became terrified, he screamed and struck about with his arms, then gradually relaxed, fell asleep for several hours and awakened apparently normal. Most of his attacks were followed by a short period of sleep. He would be free from any attack for several weeks. During the interval his mentality was normal except that he seemed unduly affectionate and quite restless.*

Another interesting mental reaction following a series of convulsive seizures occurred in the following case:

A schoolgirl, ten years of age, was referred to me May 10, 1921, by Dr. H. Oerting, of St. Paul, because of epilepsy, grand mal type, and because of attacks of angioneurotic edema. She came from a neurotic family, but had a negative personal history. She had suffered from angioneurotic edema for two years and during the past six months had three grand mal seizures. She was placed on luminal. From May, 1921, till April, 1924, she had only one slight convulsion (February 14, 1924). She discontinued the luminal in March, 1924, and the following month she had four convulsions in one day, one of them occurring while eating her dinner. Following this she developed a fear that if she would eat or drink anything or would talk the convulsions would recur. For three days she did not take a bite of food or a drop of liquid or say anything but yes or no. After considerable persuasion she finally took a little food and some water, while the mother and I were in the room with her. Gradually this fear subsided and she ate and talked normally. However, her mother had to remain with her constantly for over one month because she would become terrified when left alone lest an attack should recur. She refused to leave her home, go for walks or play with other children. Her actions were slow; she required several hours to dress herself or eat a meal. She developed other phobias; she contracted a slight bronchitis with a cough and was convinced that she had tuberculosis. For a few days she was afraid lest she might die from some obscure disease, thought she had syphilis, or might get a stroke. She gradually improved and at present is apparently normal mentally. She has had no further convulsions. Her attacks of angioneurotic edema are continuing, fortunately without any terrifying effect to the patient.

The following case presented a very distressing mental attitude during the development of her epileptic dementia:

A girl, aged 14, who had suffered from frequent grand mal and petit mal attacks for six years, gradually deteriorated mentally. Associated with this she manifested undue jealousy towards her younger sister. She would strike and bite her. Several times she threw dishes at her, would threaten to kill her, and on one occasion attacked her with

a butcher knife. Fortunately her father was present and intervened or she would have seriously injured her. Towards her other playmates and strangers she showed no evidence of this. Under luminal medication her attacks became less frequent and she improved mentally for about one year. Her symptoms recurred and soon after it became necessary to remove her from her home because of the continued threatened attitude towards her sister. Her mental deterioration is progressing.

Epileptic automatism is usually grouped under the head of epileptic equivalents. This frequently occurs during the post-epileptic period and the patient unconsciously performs some unusual act of which he has no recollection afterwards. A discharged soldier, twenty-five years of age, walked out of a store where he had been shopping and had a slight convulsive seizure. He immediately got up, walked into the middle of the street, and proceeded to disrobe. After he was entirely undressed he suddenly seemed to realize what had occurred and ran for shelter. Except for this one attack he had manifested only grand mal seizures over a period of six years.

Another case, a young girl, aged fourteen years, was referred to me because of peculiar hysterical attacks which had occurred at irregular intervals. Her family and personal history were negative. Her mother stated that she had eight attacks during the past year. The patient answered questions promptly but during the course of my examination she developed one of her spells. She became restless for a few minutes, stared, her pupils dilated, she jumped up from her chair, ran to the corner of the room, danced a jig accompanied by bizarre movements of her upper extremities, gradually quieted down, her expression became normal, and she returned to her seat. She had no recollection of what had transpired.

Cases presenting dual personalities with periods of variable duration are frequently considered of an hysterical nature. However, some of these patients have been grouped under the epileptic equivalents and have been called true epileptic flights. The following case is illustrative:

A man, aged 34, was seen in consultation July 2, 1924, and gave the following history of three attacks. His family and personal history were negative. There was no evidence of grand mal or petit mal seizures. The first attack occurred in the spring of 1911 while working on the farm. He disappeared and ten days later suddenly came to and found himself at another farmhouse about one hundred and twenty miles distant. The farmer informed him that he had been there a week and had performed his work

*Since his return home he has remained perfectly well.

properly. He had been rather quiet, but apparently normal. The patient had no recollection of what occurred during the interval. In 1917 he enlisted, saw active front line duty without manifesting any nervous instability. His second attack occurred in the winter of 1920. He was found by some neighbors wandering through the fields in a heavy snow storm. He was dressed lightly, without hat or coat, and seemed confused. He had walked about six miles from home. He was taken home and his confusion gradually subsided. This attack was of about seven hours' duration. He remembered putting his team in the barn about 3 p. m. and had no further recollection until he found himself in bed about 10 p. m. His third attack occurred on March 10, 1924. He drove to town and sold a horse, evidently received a check for it, which he deposited. He remembers selling the horse, but has no recollection of getting a check or anything further until March 30. He suddenly came to and found himself in a depot in Chicago. His clothes were filthy, he had no funds. The station policeman told him that he had been sitting around the depot all day and had acted apparently normal. There was no evidence of any hysterical manifestation in his make-up.

These few case reports and brief gleanings from the literature offer nothing new but were gotten together at the request of several of the physicians who attended the clinic on epilepsy in the short post-graduate course this year where some of these patients were presented.

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THE COMMON COLD*

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Medical literature of the last decade and more has contained an immense amount of fact and theory concerning foci of infection within the human body. That foci of infection have an intimate etiologic relation to systemic manifestation has been proven repeatedly by clinical and experimental evidence. Many diseases that previously were thought to be due to constitutional disturbances, idiopathic diatheses and dyscrasias are now understood to be complex manifestations of infection.

Primary focalizations of pathologic organisms within the body depend mainly upon two very important factors: (1) the amount and virulence of the invading germs, together with the time over which it extends; (2) the resistance offered by the body at the point of contact. There are other factors, to be sure, which have to do with the body becoming host to these organisms, but it is the resistance offered by the body at the point of contact to which I wish to call your attention.

The relation of persistent foci of infection to secondary manifestations, and to the predisposition to recurrent acute systemic infection is not so generally understood, especially in the upper respiratory tract. However, what I may say regarding this region and organs obtains in all the organs of resistance at the various openings of the body surface, where the skin and mucous membrane meet. W. Stuart Low has recently drawn our attention to the fact that at these vulnerable points of entrance into the body, barrier after barrier of lymphatic tissue have been lavishly and strategically placed—about the anus, vagina, urethra and the nasopharynx. Much confusion and misunderstanding, however, have arisen concerning the primary and secondary foci in the upper respiratory tract. That a primary focus of infection may, and very often does, exist with little or no symptoms is generally understood, and is doubly dangerous to the health and life of the individual, because of this fact. Thus a primary focus of infection within the nose is frequently overlooked and the part it has played is quite covered up by symptoms of pain and distress

*Read before the staff of St. Mary's Hospital, Duluth.

coming from an acute infection within a secondary focus. An inflamed tonsil or an aching tooth or a distressed and painful middle ear are certainly not always primary foci of infection.

In the vast majority of cases these are secondary to nasal infections, established early in life, which as the years pass become silent and chronic, hence easily overlooked in our search for a primary lesion. Thus secondary foci of infection along the pathways of the lymphatics leading from these areas, are often mistaken as primary.

In the open air, nasal infections are of small account in those with normal noses, and those who are already infected are greatly benefited and largely relieved of symptoms referable to the nose by life in the open. When men congregate in buildings nasal infections assume more serious importance, and those whose nasal anatomy is defective are the first to suffer. However, by the removal or treatment of secondary foci of infection resulting from this defective function of the nose, it is quite impossible to expect or to get any permanent improvement or lessen the patient's liability of becoming infected.

About the gallbladder have waged the storms of controversy whether to remove or to drain. Think you that the removal or drainage has much, if any, effect, on the distribution of germs and toxins from the source of infection of which it is a secondary focus.

If the tonsils and adenoids (as many believe) are the primary source of infection, their removal should stop nasal infections; but this is not true. If the teeth are primary, early treating and pulling should stop head colds, but this does not follow. Nasal infections are a distinct entity, and must be regarded as primary. Yet, during all our surgery, necessary and unnecessary, the nose and its dysfunction calls for no investigation on the part of the surgeon or internist. Mentioned in passing, but of momentary and trivial importance, "tonsils and nose negative." Yet, in a high percentage of cases there is a definite history of repeated nasal infections and head colds extending over months, and even years.

In the treatment of septic poisoning of the hand, the removal of the swollen and painful lymphatic glands of the axilla would be analogous to our present-day treatment of swollen and painful tonsils following a nasal infection, either acute or chronic. Tonsillar and adenoid infections are

usually the direct result of mouth breathing, as is also true of a large majority of diseases which enter the body by way of the upper respiratory tract. This relationship, which most certainly exists, is frequently overlooked, often because the patient or his medical advisor has accepted acute or chronic nasal infection as a more or less normal condition, unmindful of the fact that infections within the membranes of the nose are produced by the same germs in the same manner as though infection had entered through, and by way of, an abrasion in the skin. In order that any organ of the body develop and become of some use to its possessor, it must be used. How then can the nose develop and serve its purpose if periodically or constantly it is not used? Here, as in a petri dish, colonies of germs grow and elaborate their toxins, and here as elsewhere in the body anatomy does not develop because of this self-same reason. Hence, in the growing child who is a mouth breather, the nose fails to develop in direct proportion as it is not used and chronic infections result.

A wet nose is usually an infected nose and consequently largely a functionless organ, and is of little value to its possessor. The nose is an organ for warming, moistening, and cleaning the air we inhale. How then can it function or carry out this highly important service with its membranes bathed in mucopus? Or in what manner can the nose function when the nostrils are blocked? Writers, for years, have drawn our attention to the defects of nasal drainage, but why speak of drainage in an organ that is designed to handle air? The observation that para-nasal sinusitis often results from a defective placing of the ostia of the sinuses is obviously incorrect, for the ostia of the sinuses are usually large enough and admirably adapted for ventilation, though very inadequate for drainage, which is an uncalled for function in the normal nose. Drainage operations on the nasal sinuses are sometimes necessary and efficient in pathologic conditions, but so long as drainage persists there can be little, if any, function. A seemingly insignificant nasal discharge that requires but little attention during the winter months is indicative of nasal infection. From this sort of a nose there can easily pass out germs and their toxins to almost any tissue of the body. Certainly, a nose of this type is of little protection to the individual so afflicted. In these cases, mouth breathing does not always obtain, the lower parts of the nose function-

ing, but in the upper and narrower areas liquids accumulate and here germs lodge and develop. From these same areas sinuses become infected which are most certainly secondary to the nasal infection. By drainage of these sinuses, little is ever accomplished of permanent value to the individual.

The prescribing of nasal sprays and douches, together with the employment of ointments and balms for the relief of nasal catarrh, shows appalling ignorance of the function of the nose, or a willful neglect of the principles by which this can be restored.

True it is that tonsils will ever have to be removed, mastoids opened and teeth filled and finally pulled, so long as our noses fail to functionate. For long before the tonsil or mastoid became infected, or the teeth became carious, long before an infected gallbladder gave symptoms of indigestion, or the appendix was the habitat of pathologic germs, that great primary focus of infection of the upper respiratory tract was dysfunctioning and had become the avenue by which these germs gained admission. I am not, however, unmindful of the fact that there are other sources of entrance into the body whereby pathologic germs may, and do, enter, but of the upper respiratory tract the nose is by far the greatest primary focus of infection.

The one great source of nasal infection in the infant is usually the common cold of the nurse or mother. So that our prophylactic measures must begin here. Other than this, abundance of fresh, clean air and life in the open will go far in preventing nasal infections. In the young child with nasal infection, and beginning dysfunction of the nose, the orthodontist is to be consulted early, in order that there may be developed and preserved for future usefulness the vital functions of this highly necessary organ of respiration.

In the adult, surgery of the nose, aside from providing temporary drainage to accumulations of pus, consists of the restoration of normal nasal function, insofar as it can be obtained with the means at our disposal, to the end that air shall freely circulate over and about the turbinates and have easy access to and from the sinuses. Other than this, surgery of this highly important organ is of small account, and merely temporizing.

Pyorrhea alveolaris may not be caused by nasal infections and mouth breathing, but without ques-

tion these are factors which prevent a normal hygiene of the mouth. Someone has said we are becoming the toothless nation; if this is true, we have long since become a noseless nation.

The intimate relationship there is between cause and effect in infectious diseases in the human body is well understood and is worthy of careful consideration. The surgeon or internist who is called upon to treat manifestations of infection within the body will often find a surprising return to health in the patient in whom he has removed or treated a primary focus of infection, and where this is not his concern, either by oversight or neglect, results will ever be disappointing.

That primary foci of infection are often silent, is a well demonstrated fact, and that secondary ones tend in the same direction must be borne in mind. Whenever we disregard the laws pertaining to physiology and normal function, when in our haste we are guilty of overlooking primary foci of infection, nature does not reverse the operation of her laws.

I have but two case records I wish to present at this time:

Mrs. R., aged 51. Present complaint: Nasal catarrh, deafness and discharging ears. The catarrh has persisted as long as she can remember and she has had her ear drums lanced repeatedly with little benefit. Operation: A submucous resection of the nasal septum was performed August 29, 1923. Result: Nasal respiration was re-established and conspicuous benefit to bodily health ensued. The discharge from the ears ceased. No home treatments were permitted. On May 5, 1924, the patient reported herself to be in wonderful health with no nasal or catarrhal trouble, her hearing having largely returned.

Mrs. S., aged 47. Present complaint: Marked deafness, slight nasal catarrh. Patient had scarlet fever at one and a half years of age and ears have discharged off and on since. On examination the patient was unable to hear a watch tick on contact. Operation: A submucous resection of the nasal septum was performed May 26, 1923. At the same time the middle turbinates were broken over. Recovery was uneventful. Result: On examination April 11, 1924, patient was able to hear a watch tick at seven inches with either ear. Nasal respiration had been largely restored. Her general health was greatly improved.

I have selected these cases at random, yet they are typical of this class of cases. Results are not all one could wish, but they have clearly demonstrated that in proportion as we are able to restore normal nasal function, we are able to relieve the patients of distressing symptoms, thereby enabling them again to take their place in society.

BLOOD CHEMISTRY STUDY IN OSTEOGENESIS IMPERFECTA—PRELIMINARY REPORT

ALBERT E. FLAGSTAD, M.D., ELIZABETH ZANGER
and LOGAN LEVEN, A.B.
St. Paul

A considerable amount of literature has been written on osteogenesis imperfecta since the coining of the name by Vrolik in 1845. The majority of these articles have dealt with the gross and microscopic changes in the bone, physical findings, hereditary influence, etiology and prognosis. In 1897 Griffith⁸ called attention to heredity, the age of onset and treatment. He collected 67 cases, 18 of which showed definite hereditary influence. The treatment was mostly experimental. In 1906 Lovett and Nichols¹¹ collected 123 cases. They found hereditary influence in 15 per cent of these. These men made a thorough study of the microscopic changes in the bone. Eddowes⁶ in 1900, Cameron⁴ in 1916, J. B. Alexander¹ in 1922, and H. Stewart¹⁶ in 1922, called attention to the blue sclera and parietal bosses. Cameron also emphasized the curvature and shortenings of the extremities, most marked in the proximal portions. Julius Hess⁹ made an extensive survey of the disease. He called attention to the hereditary factor which is especially more frequent in females. He also included a differential diagnosis of osteogenesis imperfecta, chondro-dystrophia fetalis, cretinism, mongolism, rachitis, infantile scurvy, syphilis, and tuberculosis of bones. In 1916 D. B. Phemister¹³ cited a case under observation four years which was benefited by the administration of phosphorus. The influence of the treatment was followed by x-ray studies of changes in the bone.

Regarding treatment, it is interesting to note that in 1897 Griffith called attention to the fact that it was mostly experimental. What was true then is true today concerning the real etiology and treatment of the disease, for very little progress has been made. Our treatment today is still in the experimental stage. Fortunately, however, the percentage number of cases is very little if any greater than thirty years ago.

In reviewing the literature we find repeatedly allusions to the description of the disease, its etiology, pathology, x-ray changes, and prognosis. We have found only one or two references to the blood

study in this condition. With this in mind a blood chemistry study has been made on these cases and compared with the findings in arthritis deformans, rickets, arthrogryposis congenitalis multiplex and von Recklinghausen's disease.

The primary purpose of this paper is to emphasize this special phase of our study. We feel that, while the number of cases is small, the findings are quite conclusive. It will not be out of place to cite these cases briefly and in so doing call attention to the important factors in each case together with a blood chemistry study of the whole group.

In this paper four cases of osteogenesis imperfecta have been studied, all of which have been



Fig. 1 (Case 1). Showing changes of head, squareness, left parietal boss, deformity of left forearm and lower extremities.

under observation at least three years. During these years a great variety of treatment has been used, such as Alpine light, sun rays, calcium and phosphorus, bone meal, immobilization and supports. In spite of the variety of therapy and the greatest care, multiple fractures have occurred in these individuals, deformity has progressed and, at best, results have been unsatisfactory. Scott¹³

in 1916 reported calcium study in blood and urine of 100 cases of osteomalacia, all of which were in adults and were cases of true osteomalacia, which is very different from osteogenesis imperfecta. Then, too, her method of study of the calcium content in blood has long since been discarded as too erroneous. Tisdall, Howland and Kramer¹⁷ reported a case of osteogenesis imperfecta in which a study of blood calcium was made. Other than this work we have been unable to find references to a blood study in this condition.

CASE 1. A. R. Admitted State Hospital Aug. 5, 1921. Age 13 yrs.

Present complaint.—Bones break frequently.

Family history.—One brother, two half-brothers, two half-sisters, stepfather and mother, living and well; no tuberculosis or cancer; no family traits.

Social history.—Not much schooling because of fractures.

Past history.—Difficult birth; small baby; has had whooping cough, scarlet fever, occasional colds.

Present illness.—Broken bones in arms and legs numerous; began shortly after birth, last fracture July 12, 1923. At least three fractures before admission; one since then.

Physical examination.—Poorly developed; mentality retarded; has brownish pigmentation over body. Head: large, square, irregular parietal bosses above and slightly anterior to ears. Pupils react, sclera quite blue and prominent. Nose flat; mouth and tonsils negative; chest narrow, pigeon breast; spine negative; abdomen negative, except for atonia of muscles; upper extremities, mild deformity of upper one-third of right humerus from old fracture; lower extremities, marked lateral curve of upper third of right femur and fairly marked medial bow of tibia. Leg resembles letter S. Left femur, anterior and posterior curve, and marked knocked knee; tibia and fibula bowed medially.

Laboratory.—Wassermann negative. Blood and urine negative.

Course.—Patient has had three manipulations correcting deformities, the last two being osteoclasia. The bones break very easily, fractures being almost possible by hand. On April 29, 1921, patient broke right humerus while attempting to pull door open. Patient has been on bone meal, has had sun exposure, cod liver oil, but in spite of all therapy his bones remain brittle, and fracture and deformities occur easily. This case presents almost a text-book picture of osteogenesis imperfecta.

CASE 2. A. O. Admitted State Hospital July 24, 1921. Age 2 years 9 months. Scandinavian extraction.

Present complaint.—Repeated fractures and deformities of extremities.

Family history.—No familial tendencies, one brother living and well, mother and father living and well.

Social history.—Born in Minnesota; father mechanic; home conditions good.

Past history.—Birth history negative, breast fed nine months, no childhood diseases, influenza in 1918.

Present illness.—At about four months mother became aware of something being wrong; child was restless and cried a great deal; head became large and square shaped;

developed pot belly. About this time, on very slight trauma sustained a fracture of right humerus, splinted eight weeks and then two months later refractured. In December, 1920, sustained third fracture of right humerus; March 1, 1921, sustained fourth fracture of right humerus;



Fig. 2 (Case 2). Showing deformity of extremities.

in December, 1920, mother noticed deformity of right leg due to fracture; on entrance right arm and forearm in splints and right tibia deformed.

Physical Examination.—Head square, large, irregular, parietal bosses present especially on the right; forehead flattened; fontanelles closed. Eyes, slight blueness of sclera, which are prominent; nose flattened; dentition delayed; neck and glands negative; chest, narrow, pigeon type, Harrison's groove present; heart and lungs negative; abdomen pot type, diastasis recti and general atonia of

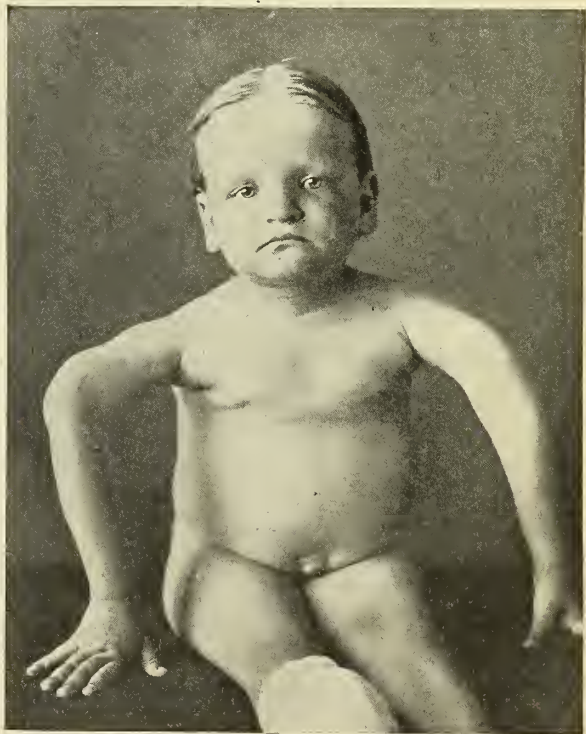


Fig. 3 (Case 4). Showing square head, irregularity, flatness of nose, deformity of upper extremities, right clavicle, umbilical hernia, relaxation of the abdominal wall.

abdominal muscles; g. u. negative; upper extremities, marked bowing of both arms confined to humerus. Since patient has been in hospital she has had several fractures of left and right humerus. Deformity of the right clavicle

from old fracture. Lower extremities, marked anterior and slight lateral bowing of right tibia. June 23, 1923, wedge was removed from right tibia to correct deformity and leg remained corrected as long as held in retention apparatus but on removal of support deformity recurred.

Laboratory.—Wassermann, negative. Blood and urine negative.

Course.—December 21, 1921, reduction of fracture of right fibula and tibia. June 23, 1923, osteotomy of right tibia. February 13, 1924, reduction of fracture of clavicle. A number of other fractures have occurred, particularly in the humeri. Retention apparatus has been applied. There seems to be very little pain associated with the fractures. On February 12, 1924, nurse making night round, found patient crying; she complained of pain over right clavicle. X-ray picture revealed a fracture which apparently was sustained in rolling over onto the right side during sleep. The deformity of the right tibia can be corrected by hand

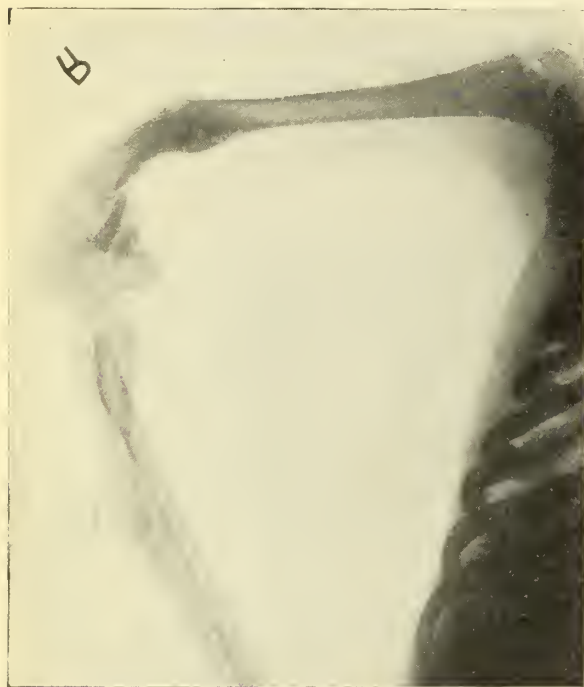


Fig. 4 (Case 2). X-ray of the right arm and forearm showing multiple fractures, also fractures of several ribs.

but it recurs almost immediately on removal of support. Patient has a marked atonia of all muscles, especially of the abdomen. Only recently she has had several very severe prolapses of the rectum. Patient has been on phosphorus, sun exposure and other therapy with little if any benefit.*

CASE 3. I. T. Admitted to State Hospital January, 1921. Age, 15 years.

Present complaint.—Deformities of both lower extremities.

Family history.—Father and mother living and well; five brothers and sisters living and well; one sister similar trouble, otherwise negative.

*Blood chemistry was made and blood values were within normal limits.

Social history.—Born in Minnesota, Scandinavian extraction, home conditions fair.

Past history.—Influenza 1920, otherwise never sick except present illness.

Present illness.—Deformities of extremities noticed shortly after birth. Right femur fractured six years ago; no other fractures; deformity of right knee more marked since fracture; has never walked.

Physical examination.—Undernourished and underdeveloped; head fairly large, somewhat irregular, slightly prominent temporal regions; eyes negative, sclera fairly prominent; nose prominent, not flat; neck negative; chest, heart and lungs negative. A large mass was felt in the lower left and right quadrants not tender. This later demonstrated to be feces, has megalocolon with situs transversus. Upper extremities, shoulder muscles good; flexion deformities of both arms about forty degrees; lower extremities; marked flexion deformities of hips and knees; marked anterior bow of both femurs confined to middle and upper one-third; rectal examination reveals marked deformity of pelvis; sacrum and pubis almost in contact; pelvic outlet about two and one-half inches. X-ray of intestinal tract shows situs transversus, sigmoid in right iliac region and markedly dilated.

Laboratory.—Wassermann, negative. Urine and blood negative.

Course.—This patient has been manipulated several times, has been on heliotherapy and bone meal; in spite of therapy, deformities recur and progress is very slow.

CASE 4. A. T. Admitted State Hospital in 1922. Age 7 years. Sister to Case 3, I. T. First seen at office October 19, 1922.

Present complaint.—Inability to walk, deformity of right leg.

Family history.—Same as Case 3.

Social history.—Same as Case 3.

Past history.—Negative.

Present illness.—Has never walked especially well, but since last summer she has not been able to walk at all; she complained of some pain in region of right hip; no history of injury; leg has become bent and shorter than left.

Physical examination.—Eyes, ears and nose negative; chest, slight Harrison groove; heart and lungs negative; abdomen negative; upper extremities negative; spine negative; lower extremities, right leg is smaller throughout than left and one inch shorter; fairly marked bowing of femur and a large callus can be palpated in region of trochanter major; left leg negative. January 19, 1921, patient was operated upon, subtrochanteric osteotomy (Ghant), cast applied and later several other casts were applied. After a series of casts, leg began to adduct again; about this time developed slight bowing of left tibia. X-ray taken and showed several green-stick fractures. December 9, 1921, x-ray of radius and ulna revealed several fractures. In spite of supports, phosphorus and glandular therapy patient's deformities and fractures continued. In summer of 1922 patient was admitted to State Hospital. Since her stay here she has had several fractures of right femur below site of old Ghant; she also developed marked coxa vara of the hips, especially the right; as soon as patient bears weight deformity follows. Therapy has had little or no beneficial effects.

BLOOD ANALYSIS

A number of determinations were run on three cases of osteogenesis imperfecta, arthritis deformans (2 cases), arthrogryposis congenitalis multiplex (1 case), rickets (1 case), and von Recklinghausen's disease (1 case). The Folin and Wu⁷ system was used in determining sugar, and nitrogenous constituents, including non-protein nitrogen, urea and creatinine. Other methods used included: Benedict's² for uric acid, Clark's⁵ for calcium, and that of Benedict¹² for the determination of phosphorus. Duplicates were run in all cases where the amount of serum permitted.

In the diseases cited above, excepting rickets, there appears to be no significant change in the phosphorus content of the blood, allowance being

In the three cases of osteogenesis imperfecta, the phosphorus and calcium were again determined after the patients had been put on a bone meal diet for a period of one month. There was some variation in the phosphorus content, but no significant increase.

The values for uric acid, creatinine, urea, total non-protein nitrogen, and sugar were within normal limits. Although the urea and total non-protein nitrogen values were, on some occasions,



Fig. 5 (Case 2). X-ray of the right leg showing numerous fractures.

made for the age of the patient and regarding the normal values to be 5 mg. per 100 c.c. serum for children and 3.7 mg. per 100 c.c. serum for adults. In the case of rickets (No. 7), two determinations on blood taken at different times showed low phosphorus values consistently.



Fig. 6 (Case 3). X-ray showing marked curve of the femur and green stick fracture in the lower third.

higher than usual, it could not be regarded as a retention.

Numerous clinical reports of osteogenesis imperfecta are recorded in the literature but very little work has been done on blood analysis. Metabolism experiments in cases of osteogenesis imperfecta by Schwarz and Bass¹⁴ showed nitrogen, calcium, and phosphorus metabolism and fat absorption normal.

Bookman³ found a subnormal calcium retention in three cases of osteogenesis imperfecta.

R. O. Klercker¹⁰ obtained results similar to those of Schwarz and Bass.

As the result of numerous experiments, Tisdall,

Howland and Kramer¹⁷ found that the calcium concentration in serum of children is constant and only altered in two conditions: (1) tetany, and (2) kidney insufficiency with or without nephritis. They found the calcium concentration normal in osteogenesis imperfecta.

SUMMARY

1. In this series were two male and two female cases.
2. Two patients were observed to have characteristic sclera and parietal bosses.
3. Heredity plays a rôle in the series; brother and sister affected.
4. All fractures were of the green-stick variety, and proximal portions were most often affected. Union as a rule was good.

the use of sun and Alpine light, supports when needed, and the prevention and correction of deformities.

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Case	Age	Sex	Date	Diagnosis	BLOOD ANALYSIS MG TO 100 CC							Remarks
					Phos-phorus	Calcium	Sugar	Non protein N	Urea N	Creatinine	Uric Acid	
1 A R	16	♂	4/24	Osteogenesis imperfecta			116.5	22.4	13.5	14		
			5/22		4.27	12.12						
			6/2		3.90	11.30		36.6	12.6			
3 I T	19	♂	4/24	.			86.3	25.6		1.7	2.5	Bone meal diet
			5/15		5.03	12.32						
			5/22		4.16	11.73						
4 A T	9	♀	6/4	.		11.80			15.9			Bone meal diet
			4/19				85.0	37.5	20.4			
			5/15		5.20	11.04						
			6/4		6.36	12.60						Bone meal diet
			5/15		5.00	9.83						
			5/8				92.9	51.2		2.5	2.2	
6 O R	19	♂	5/8	Arthrogryposis congenitalis multiplex		11.67	94.7		19.7	1.2	2.3	
7 C M	11	♂	5/1									
8 V L	10	♀	5/8		3.39	10.17	92.7	43.9	13.0	2.5	2.3	
			5/22	Rickets	2.95							
9 V T	18	♂	5/8	von Recklinghausen's disease			83.8	36.6	13.4	2.7	2.0	
			5/22		4.80	12.71						
			5/29		4.46							

Fig. 7. Chart of blood chemistry findings.

5. There is comparatively very little pain associated with fracture.
6. Blood chemistry study reveals normal calcium and phosphorus values; sugar, total non-protein nitrogen, urea, nitrogen, creatinine and uric acid within normal limits.
7. Bone meal in diet caused no variation in blood values.
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EDITORIAL

Medical Meetings in 1925

At a meeting November 14, at the Nicollet Hotel in Minneapolis, called by Dr. Burnap, president of the Minnesota State Medical Association, representatives of the Northern and Southern Minnesota Medical Associations, the Hennepin and Ramsey County Medical Societies and the Tri-State District Medical Association met and discussed the correlation of medical meetings as to time and place. The co-operation shown at this meeting was most satisfactory. As a result of the discussion, the 1925 state medical meeting is to be combined with Minneapolis Clinic Week and will be held in Minneapolis the last week in April or the first week in May. The date has been advanced from fall to spring so as to avoid conflict with the Interstate Post-Graduate Assembly of the Tri-State Medical Association, which will meet next year in St. Paul, the week of October 26th. This meeting, which is the outgrowth of the Tri-State Association, has, in a way, supplanted the clinical meetings of the Southern Minnesota Medical Association and has shown

a phenomenal growth under the management of Dr. Peck of Milwaukee. Originating as a tri-state meeting, including the states of Illinois, Wisconsin and Iowa, this convention has expanded until now it includes some twenty-two states and its yearly post-graduate course of a week offers clinics to the profession conducted by University professors or associate professors of the highest grade attainable. That the clinics are appreciated is attested by the large attendance at the recent meetings, over 2,700 physicians being registered at the Milwaukee meeting the last week in October. Those who attended the last meeting were for the most part on hand at 7 A. M. and the evening sessions, which lasted usually until 10 P. M., were well patronized. Minnesota is fortunate in having the meeting next October. The Auditorium is ideally adapted for such a large meeting, the large stage affording a sufficient area for exhibits.

One such large clinical meeting being scheduled for St. Paul in 1925, it was deemed advisable to omit the annual St. Paul Clinic Week for next year. The combination of Minneapolis Clinic Week and the state meeting in Minneapolis in the early spring is a happy solution of the division of these two large meetings as to time and place.

The Northern Minnesota Medical Association is scheduled for Brainerd in July, 1925, and the annual meeting of the Southern Minnesota Medical Association, which has been tentatively set for May, will doubtless be changed so as not to conflict with the state meeting.

Minneapolis is to have the National Tuberculosis meeting, June 15. Tuberculosis specialists from all over the United States and Canada are expected to attend the meeting of this national organization.

Minnesota is, so to speak, on the medical map for 1925.

Association Affairs

The Minnesota State Medical Association has shown a steady growth in membership during the last few years, until now we number close to 2,000 members. This places us in the list of the larger state associations.

It is high time that the affairs of our Association were placed in the hands of a member of the profession who is not occupied with the demands of private practice. The argument for a full time

secretary is well presented in a communication which has been sent to each county society secretary by the committee of those appointed by the Council and House of Delegates to investigate and act in the matter. This communication appears elsewhere in this number of MINNESOTA MEDICINE. The subject is a live one and should be discussed by the component societies of our State Association, and the matter of an increase in association dues to meet the increased expense of such a step should not be allowed to drop, but should be acted upon by the House of Delegates at our spring meeting.

A step in the right direction has been taken by the appointment of Dr. E. A. Meyerding, the present executive secretary of the Minnesota Public Health Association, as executive secretary of the Minnesota State Medical Association. He was chosen by the special committee of those above mentioned and his appointment was confirmed by the Councilors present at the meeting called at the Nicollet Hotel in Minneapolis, November 14th. Dr. Meyerding is directly responsible to the Council, receiving his appointment by the Council rather than being elected yearly by the House of Delegates. MINNESOTA MEDICINE offers to Dr. Meyerding its closest co-operation in the furtherance of the work of the Association.

Dr. Everett Geer of St. Paul has been appointed general secretary of the Association for 1925 to replace the present secretary, who again tendered his resignation, effective January 1, 1925.

The death of Dr. F. L. Beckley, treasurer of the Association, necessitated the appointment of his successor. The choice of the Council fell upon Dr. Earle R. Hare of Minneapolis, who through his former secretaryship in the Association is particularly qualified for the position.

A new era in the history of the Association is about to be entered upon and with the co-operation of all our members it should prove to be one of distinct progress.

Increasing the State Society Membership

No one should need to be convinced that every eligible physician should be enrolled in our state society. If there was not the obvious incentive that strength comes with numbers, and mutual advantage with completer contact, we might mention the larger circulation of the Journal, its better resul-

tant advertising rates, and the general lessening of overhead. Presently there is the prospect of getting into line with other states who have secured a properly qualified, whole-time secretary, for their association. With our own membership considerably increased, this would be easier of accomplishment.

Such beneficial increase can only come through direct effort on the part of the officers of our local societies, aided, possibly, by some incentive from our central body. Just what form this should take is a problem for someone to work out. Nevertheless, an analysis of last year's gain of sixty-eight members in the state association is of interest when contrasted with the turn-over of memberships in the St. Louis County Medical Society alone. Secretary Magney reported in November, 1924, that St. Louis County showed a total gain of twenty-six for the year, and a loss of six from death, change of location, etc., leaving a net gain of twenty, or just about thirty per cent of the gain for the entire state. This, even for a large county, is a splendid showing, and due almost entirely to the efforts of the secretary and the very efficient chairman of the special Membership Committee.

This is written to point the way for others to help out in the ultimate increase in our state membership. Make the County Society meetings worth while; make it disadvantageous for any qualified man to either stay out or away.

E. L. T.

MISCELLANEOUS

STATE SECRETARYSHIP

The following letter has been sent out to the secretary of each county society and deals with the matter of a full time secretary for the State Association. Members of the profession are urged to read this to familiarize themselves with this matter.

To the Secretaries of the County Medical Societies:

At the recent meeting of the State Medical Association at St. Cloud a committee from the Board of Councilors was empowered to secure a full-time secretary, with the stipulation that it should be done without immediate increase in the present annual dues. Since it is manifest that the expense incurred will necessitate a slight increase in dues in the future, the House of Delegates believed it advisable to bring the matter up for consideration before the County Societies.

It has been the experience of the seven state associations which have already adopted the plan of having a full-time

secretary that the benefits to the profession derived from this change more than compensate for the increase in dues. We have written to several state associations now employing a full-time secretary, and the answers received are unanimous in approval of the plan. Doctor West, Secretary of the American Medical Association, strongly urges that every state association with a membership of 1,400 or more should have a full-time secretary. He says, furthermore, "There can be little doubt that the association whose business receives the attention of a competent full-time secretary, with that business his only concern, will have decided advantages and will maintain more efficient organization than that one whose executive officer must, of necessity, devote most of his time and energy to his own personal affairs."

In order to meet the demands for better organization of the medical profession for the purpose of solving the various problems confronting us, in order to elevate the standards of our profession, and in order to stimulate co-operation and education of the laity in matters of public health, it will be necessary to employ a man who can devote his entire time and energies in order to accomplish the best results.

I. *State Organization*.—Although the profession in the state is fairly well organized, and much credit should be given to the officers of this association who have helped to make it so, nevertheless, increased organization and closer co-operation are necessary to solve the numerous problems bearing upon the welfare of the profession which are continually arising. According to a recent estimate, there are approximately 600 licensed physicians in Minnesota who are not members of the State Association. In several counties the meetings of the county societies have been allowed to lag and have not maintained the standard which they should. It is evident that a man who could devote part of his time to visiting the various county societies could be of great help to them. By means of personal contact, issuing of bulletins, etc., the work of the individual units would be greatly furthered. Their members would be kept informed as to proposed and passed laws affecting the practice of medicine, as well as on other matters with which they should be familiar.

II. *Closer Co-operation* in the movement to instruct the public in matters pertaining to health. Although we have identified ourselves with several organizations which are ably conducting health instruction campaigns, a closer co-operation on the part of the organized profession would be desirable. In order to bring this about, it would require considerable time and effort and the establishment of an office representing the state association. Active supervision of the increasingly important method of public instruction by means of the radio would come under the province of this office, and would alone require much time and energy in order that the right men should be selected and also that the method would not be subject to ethical criticism.

III. *The Matter of Supervision of Legislation*.—Although this has been ably done by the Committee on Legislation in the past, according to the report read at the last meeting by the committee, they advise securing a man who can devote his entire time to this all-important work. It is easily conceivable that no man who is engaged in private practice can devote the amount of time necessary to successfully carry on this work.

IV. In keeping with the other progressive states, at the recent meeting of the House of Delegates it was recommended that steps should be taken to establish a system of post-graduate education which would be carried to the various centers throughout the state. Similar methods of organized post-graduate study have proven successful in other states. The program includes a schedule of lectures and clinics on live subjects by recognized authorities, to be given in various portions of the state. In this manner the members of the profession are enabled to attend these lectures with a minimum loss of time and expense. In order to carry out this plan, it would be necessary for the state association to be represented by some official who would have sufficient time to keep in touch with the countless details involved in its successful development.

It would be the secretary's duty to secure close co-operation with all of the organizations in the state which are interested in health problems, such as the Bureau of Vital Statistics, State Medical Board, State Nursing Association, Minnesota State Board of Health, Minnesota Health Association, etc. It has long been felt that there should be a closer co-operation between such departments and medical activities carried on in this state. Not only is this desirable from the standpoint of efficiency, but also from the standpoint of economy.

Among the many other functions that a full-time secretary may assume are the following:

As a permanent and full-time officer, he would have the time and experience to be of much assistance in arranging and selecting the scientific program at Annual Meetings. Although most of the committees appointed are conscientious in the discharge of their duties, in many instances they could be made more efficient through the co-operation and stimulus of a full-time secretary. There are other details, too numerous to mention, which only a full-time secretary can successfully handle.

We are sure that every member of the State Medical Association will be back of this movement, which promises much for the benefit of our profession. Our Association has always been known for its progressiveness and it cannot afford to lag behind in the pace set by surrounding states.

Respectfully,

H. M. WORKMAN,

CARL DRAKE,

W. F. BRAASCH, Chairman,
Committee.

THE GORGAS MEMORIAL

During the past year, throughout the United States, the work of organizing the Gorgas Memorial State Governing Committees has been progressing. In some states the response has been most enthusiastic, while in others considerable effort has been necessary to bring home to the doctors the importance of this movement to them, individually and collectively. Inasmuch as the Gorgas Memorial is primarily a medical movement and as such must have the united support of the profession if it is to make the proper impression on the general public, we take this occasion to outline briefly the Gorgas plan and to request the co-operation of our colleagues in bringing to a successful issue this national health program.

We are planning to establish a Memorial for our former chief, Major General William Crawford Gorgas, not of marble or bronze, but a permanent living organization in the form of a great health foundation typical of his work in research and curative medicine, that will unite laymen and doctors in an intelligent effort to obtain better personal health—a health guild that will be supported and directed by the representatives of curative medicine.

The Gorgas Memorial consists of two phases:

1. An Institute in Panama for research in tropical diseases.
2. A health educational program in the United States and other countries that wish to co-operate and participate in the movement.

We are living in an age when people are knocking at all doors of knowledge and demanding that they be admitted. In the field of medicine who are so well fitted to meet this demand as those actually engaged in the practice of medicine? The doctors have a far more interesting and important message to deliver than any other group.

In the United States today there is scarcely a community that has not its quota of irregular "medical practitioners," so-called. In many states there are strong organizations of the representatives of the various cults, whose theories are imposed upon an uninformed public. Public ignorance is encouraged by professional reticence and the result is the astounding growth of unscientific methods. If the profession is to maintain the high standing to which centuries of labor in behalf of suffering mankind entitles it, it is essential that a definite organized effort be made to familiarize the public with such facts as will impress upon it the importance of medicine's contributions to human welfare. A constant fund of proper health information through the newspapers, magazines, lectures, moving pictures and the radio, furnished by medical men and women of known reputation and standing, will direct the public to the proper source for medical advice and gradually eliminate the irregular practices constantly increasing.

One of the objects of the Gorgas Memorial is to furnish a channel through which this kind of information may be disseminated. It cannot be done by individual physicians. It must be conducted by a dignified, ethical organization, controlled by the medical profession. The name of Gorgas is synonymous with "better health." No more appropriate name could be adopted for a movement that has for its object *the development of co-operation between the public and scientific medicine for the purpose of improving health conditions by implanting the idea in the mind of every individual that scientific medicine is the real authority in all health matters and as such should be recognized as the source of health instruction.*

Before we ask the public for financial and moral support, it is essential that the doctors of the country unite in support of this program. As a means to this end, Governing Committees are now in process of organization, on the basis of 100 members to every 1,000,000 population in each state. Seventy-five per cent of the personnel of each Committee will consist of medical men and 25 per cent of influential laymen and women. The permanent activities of the organization will be supervised by these Committees in their respective states, in co-operation with the National Executive Committees.

An organization cannot operate without funds. We are endeavoring to raise an Endowment of \$5,000,000, the interest only of which will be utilized to carry on the work. The principal will be invested in trust securities and remain intact. None of the money thus obtained will be spent for buildings or equipment. The Republic of Panama has donated the site and guaranteed the initial buildings and equipment for the tropical research laboratories, in recognition of Gorgas' great work in Panama. Those invited to serve as Founder members of the State Governing Committees are requested, as they accept membership on the Committee, to subscribe \$100 to the Endowment Fund, payable within two years. Every individual on the State Committee is a contributing member. When the medical nucleus of the organization is complete, a general appeal for funds will be made to the public.

The American Medical Association, at its recent meeting in Chicago, passed the following resolution:

"RESOLVED, That the House of Delegates of the American Medical Association, convinced of the great promise which the Gorgas Memorial contains of benefit to humanity through improved knowledge of preventive medicine and tropical disease, and of its peculiar adequacy, as a tribute to our great leader and sanitarian, recommend to the organized profession of the country, through its constituent state and county societies, the enthusiastic support of the project."

J. A. WITHERSPOON, Tennessee,
JOSEPH RILUS EASTMAN, Indiana,
THOMAS CULLEN, Maryland,
W. H. MAYER, Pennsylvania,
F. B. LUND, Massachusetts.

The Memorial has also been endorsed by numerous other medical and civic organizations.

Every doctor is requested to take a personal interest in the Gorgas program and to see that his community is adequately represented on the State Governing Committee. Each County Society should appoint officially at least one of its members to serve on the State Committee. This is one foundation that is controlled by the practitioners of curative medicine and as such should be supported by every practicing physician. Let us pull together, "the doctor for the doctor."

FRANK BILLINGS,
GILBERT FITZPATRICK,
SEALE HARRIS,
W. H. G. LOGAN,
SAMUEL J. MIXTER,
G. H. DE SCHWEINITZ,
REAR ADMIRAL E. R. STITT,
GEORGE CRILE,
WILLIAM D. HAGGARD,
FRANKLIN MARTIN,
WILLIAM J. MAYO,
STUART MCGUIRE,
ERNST A. SOMMER,
RAY LYMAN WILBUR,
SURGEON GENERAL HUGH S. CUMMING,
MAJOR GENERAL MERRITTE W. IRELAND,
C. JEFF MILLER,

BRIGADIER GENERAL ROBERT E. NOBLE,
GEORGE DAVID STEWART,
HUGH YOUNG,

Medical Members, Board of Directors
Gorgas Memorial Institute.
Executive Offices: Chicago, Ill.

Officers and lay members, Board of Directors:

President Calvin Coolidge, Honorary President.
Franklin Martin, Vice President.
George M. Reynolds, Treasurer.
W. J. Sennett, Assistant Treasurer.
Silas Strawn, Attorney.
Honorable R. J. Alfaro.
Brigadier General Charles G. Dawes.
Bernard Baruch.
Tyson Dines.
Samuel Gompers.
W. P. G. Harding.
Judge John Bassett Moore.
Adolph S. Ochs.
President Beliasario Porras, Panama.
Leo S. Rowe.
Fred W. Upham.

RED CROSS SEALS

Minnesota's seventeenth annual campaign to raise funds for the 1925 campaign against tuberculosis through the sale of Christmas Seals is now on. In every corner of the state an intensive health educational and fund-raising campaign is in progress. Physicians of the state, who have always been among the most enthusiastic boosters for the Christmas Seal, are enlisted in large numbers in the huge army of volunteer workers. The officers of the state association are: Dr. H. Longstreet Taylor, St. Paul, president; Dr. N. O. Pearce, Minneapolis, vice-president; Mrs. J. A. Thabes, Brainerd, secretary; and W. A. Laidlaw, St. Paul, treasurer. Dr. E. A. Meyerding, St. Paul, is executive secretary.

The Northwestern Health Journal, which was recently endorsed and highly praised by the Minnesota State Medical Association at its annual meeting, is one part of the educational program made possible through the penny Christmas Seals. The 1924 activities of the Minnesota Public Health Association also included the distribution of more than 220,000 pieces of health literature on various subjects; physical examination of more than 4,000 children, a large number of whom were referred to family physicians for treatment of previously-unsuspected bodily disorders; 36 tuberculosis clinics; the enlistment of 40,000 children in the Modern Health Crusade; the planning and display of health exhibits and the services of a Health Clown at county fairs and at the state fair; the partial support of public health nurses in nine counties; health lectures in 44 counties; and an extensive newspaper publicity campaign.

Special educational campaigns for periodic physical examinations, early treatment of physical defects and more abundant use of fresh air were also included in the year's work.

"Buy and Use Christmas Seals" is the clinic slogan for this year, and it is hoped that every letter, Christmas card and package will carry one of the little "for health" stamps.

OBITUARY

DR. HORACE GREELEY MURDOCK, 1858-1924

Horace Greeley Murdock was born at Rensselaer Falls, St. Lawrence Co., New York, on January 10, 1858. He was the son of Dr. Thaddeus and Lucinda Allen Murdock and was the youngest of nine children.

He attended school at Rensselaer Falls and Gouverneur, N. Y., and later went to Oberlin College. He taught school between school sessions for two terms and also studied law a short time but finally decided to follow in the footsteps of his father, three brothers, two uncles and two cousins who were physicians. He entered Rush Medical College, Chicago, and graduated from there Feb. 22, 1881.

He practiced medicine at Glenwood, Minn., for two years.

On Oct. 20, 1881, he was married to Luella M. Daubney, of Taylors Falls. Three children were born to them; Earl, the oldest, was drowned in the St. Croix river, but two daughters survive him. Mrs. Murdock died Sept. 26, 1913.

On January first, 1883, he bought out his brother, Dr. A. J. Murdock, at Taylors Falls, Minn., and practiced there until November, 1919, when he was obliged to give up his work. He worked day and night during the "flu" epidemic and after it was over collapsed. He had been a great sufferer from rheumatism for twenty-five years but in spite of it continued his life work.

On March 31, 1923, he was married to Frances W. Folsom, of Taylors Falls.

He was confined to his home for the last five years of his life but always took a deep interest in the people of the community and many went to him for advice. He had always been a great reader and was deeply interested in all affairs of the day, at home and abroad.

When he first practiced at Taylors Falls there were only three doctors within a radius of forty miles which necessitated long drives in cold and wet weather. He often kept five or six driving horses. The coming of the auto meant much to him.

He died at his home at Taylors Falls, August 3, 1924, of angina pectoris, after a severe illness of two weeks' duration. He is survived by his widow, Frances F. Murdock, two daughters, Beatrix M. Davidson, of Duluth, Minn., and Fannie M. Dike, of Rio Linda, California, and one sister, Mrs. Flora M. Doty, of Rensselaer Falls, New York.

He served as president of the Chisago-Pine County Medical Society for several years. He belonged for many years to that society and also to the Minnesota Medical Association, American Medical Association and the Soo Surgical Association.

He was a member of Zion Lodge A. F. & A. M. at Taylors Falls, and was also a member of the Modern Woodmen of America.

Five Dr. Murdocks practiced at Taylors Falls: Dr. Henry Murdock, a cousin; Dr. Hiram Murdock, an uncle; Dr. George Murdock, a cousin; Dr. A. J. Murdock, a brother; and Dr. H. G. Murdock.

DR. FREDERICK LEE BECKLEY

Dr. F. L. Beckley, widely known St. Paul physician, and president of the Minnesota Transfer State Bank, died at 12:40 P.M. Thursday, October 23, 1924, at St. Joseph's Hospital, following a short illness. He was 53 years old. Dr. Beckley had been in a critical condition since an operation performed the previous Friday.

Dr. Beckley was a native of Minnesota and spent his early boyhood at Paynesville, where he was educated in the public schools. After deciding to follow the medical profession, he entered the University of Minnesota, where he worked his way through the Medical College and was graduated in 1897. After graduation he became associated with Dr. S. G. Cobb, with whom he had lived while at the University. Five years ago Dr. Beckley opened offices with Dr. John Ryan at Prior and Roblyn avenues, St. Paul.

Dr. Beckley was well known as an ardent golfer and was president of the Town and Country Club in 1922-23. He also was a member of the St. Paul Athletic Club, of St. Paul Lodge No. 3, A. F. & A. M., and a Shriner.

Surviving Dr. Beckley are his widow, a brother and sister in California, a brother in North Dakota, and a nephew, Dr. Chester Roche of St. Paul.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA PUBLIC HEALTH ASSOCIATION

At the annual meeting of the Minnesota Public Health Association held in St. Paul, November 6, Dr. H. Longstreet Taylor, St. Paul, was re-elected president; Dr. N. O. Pearce, Minneapolis, vice-president; Mrs. J. A. Thabes, Brainerd, secretary; and W. A. Laidlaw, St. Paul, treasurer. Directors were elected for the regular three-year terms.

Dr. E. A. Meyerding, executive secretary, reported the distribution of more than 220,000 pieces of health literature, free physical examinations given to more than 4,000 children, the holding of thirty-six tuberculosis clinics, free lectures in forty-four counties, and public health nursing service in nine counties.

LYMANHURST AND PARKVIEW STAFF MEETING

The regular monthly meeting of the Lymanhurst and Parkview medical staffs will be held at Lymanhurst School, 1800 Chicago Avenue, Minneapolis, Tuesday evening, December 23, at 7:00 o'clock.

Following is the program for the evening:

"Anesthesia in the Tuberculous Patient," Dr. R. E. Farr.

"Surgery of the Genito-Urinary Tract and Chest," Dr. S. R. Maxeiner.

"Surgery of the Abdomen and Lymphatic System," Dr. R. R. Cranmer.

All persons interested in tuberculosis are invited to attend these meetings and participate in the discussions.

OF GENERAL INTEREST

Dr. F. D. Smith, of Kasson, attended the Tri-State Medical meeting at Milwaukee, in November.

Dr. Roy F. Raiter, Cloquet, has returned from a month's visit to the various clinics in New York City.

Mr. David Shepard, St. Paul, has been chosen president of the Board of Trustees of St. Luke's hospital in that city.

Dr. A. K. Stratte, formerly associated with the Northern Pacific Beneficial Association Hospital, is now located at Pine City, Minnesota, where he is doing general practice work.

Miss Anne Toben, daughter of Mrs. Theodore Toben, Duluth, became the bride of Dr. Earl R. Lowe, of South St. Paul, November first. Dr. and Mrs. Lowe are now at home in South St. Paul.

Dr. Harold T. Nesbit has announced the opening of offices at 322-323 Lowry Building, St. Paul, for the practice of his profession. Dr. Nesbit limits his practice to the diseases of infants and children.

Dr. Arthur E. Mark, formerly of the Mayo Clinic, Rochester, and of the Miller and Earl Clinics, St. Paul, has recently moved from Long Beach, California, to Hollywood, where he is located in the Taft Building.

Dr. D. C. Lohead, field secretary and clinician for the Minnesota Public Health Association, has resigned to accept the position of deputy health officer of Rochester, of which city Dr. Charles H. Mayo is health officer.

Dr. J. A. Myers, Minneapolis, read a paper before the Hardin County Medical Society, Eldora, Iowa, the week of November 10. The previous week, Dr. Myers presented a paper before the Trudeau Medical Society, Ann Arbor, Michigan.

Scholarships on the Oliver-Rea Foundation for graduate study in medicine are available at the New York Post-Graduate Medical School and Hospital. Inquiries should be addressed to the Dean, 301 East Twentieth Street, New York City.

Dr. W. E. Belt, of Dodge Center, attended the Violin Makers' Convention at New York last month. The doctor has a completely equipped shop and has been making violins as a hobby for many years. Some of these have been unusually fine and commanded a high price.

Few are acquainted with the existence at Carville, Louisiana, of a National Leprosarium for the care of those afflicted with leprosy in this country. Its present capacity of 211 beds is continually overtaxed, but in the near future facilities will be increased to 415 beds. It is estimated that there are 500 to 1,000 lepers still at large in the United States, who, to a certain degree, are a menace to public health.

The American Chemical Society announces a Prize Essay Contest for the school year 1924-1925, open to high and secondary school students, consisting of six scholarships at Yale University or Vassar College with tuition fees and \$500.00 annually for four years. Six prizes of \$1,000.00 each are offered to college undergraduates in addition to the above. It is not required that students be enrolled in courses of chemistry as the purpose of the contest is to arouse interest in the general subject of chemistry. Information may be obtained from the Secretary of the Committee

on Prize Essays, Alexander Williams, Jr., 85 Beaver Street, New York City, N. Y.

The National Board of Medical Examiners was organized to establish a standard qualifying examination of such character that its certificate of qualification to practice medicine would be accepted by medical licensing boards in all states, and the holder of this certificate be granted a license to practice without further examination. To date its certificate is accepted by 29 states and territories and several foreign countries. The Board aims not only to safeguard and simplify the process of determining those who are qualified to practice medicine, but to aid the medical colleges and state authorities in promoting high standards of medical education and practice. Examinations are open only to students of Class A Medical Schools, which automatically makes it impossible for candidates with fake diplomas to secure its certificate and in this way helps the State Boards in keeping out unqualified practitioners. Examinations were held this year in Minnesota at Fort Snelling. Headquarters are located in Philadelphia.

SMALLPOX

An epidemic of malignant smallpox has recently developed in Minneapolis, fifty-five deaths having been reported from the first of the year to November 18th. The epidemic at this date seemed to be on the increase, 157 cases being under quarantine as compared with 124 a week previous. The total number of cases so far this year has totaled 523.

In St. Paul there have been 688 cases since the first of the year with five deaths reported. It is not generally appreciated that St. Paul has had actually more cases of smallpox this year than Minneapolis. The Minneapolis variety has been much more malignant, however.

The rush for vaccination by the population in both cities has some interesting features. No activity on the part of physicians has been necessary and little has been heard from the anti-vaccinationists. The following facetious editorial appeared in the Fairmont Daily Sentinel, November 15th:

"Someone started the smallpox scare in the Twin Cities. Result, hundreds of thousands are being vaccinated. Meantime word comes from the Rochester clinic that the chief benefit from vaccination is removal of the scare—and of course Rochester is the last word in medical wisdom. It is a great graft for physicians, the charges being all the way from \$2.00 up, according to the quality of your stockings and the size of your diamonds."

The editor forgot to mention that the Health Departments of the Twin Cities have been vaccinating thousands of citizens daily free of charge so that those who consider the usual fee exorbitant can obtain vaccination for nothing. Also no mention is made of the fact that all vaccinations so far have been submitted to voluntarily. The inference derived from the above quotation is that vaccination does not protect against smallpox. The average Twin City citizen apparently does not agree with the worthy editor of the Daily Sentinel, who is nothing loth to display his ignorance of smallpox infection. When smallpox hits Fairmont, as it some day doubtless will, we wonder whether the editor of the Daily Sentinel will be consistent and avoid the immunity afforded by vaccination.

NEW AND NON-OFFICIAL REMEDIES

The following articles have been accepted by the Council on Pharmacy and Chemistry:

BATTLE CREEK FOOD COMPANY:

Lacto-Dextrin

ELI LILLY AND COMPANY:

Pituitary Extract-Lilly (Obstetrical)

Pituitary Extract-Lilly (Obstetrical), 0.5 c.c.

Pituitary Extract-Lilly (Obstetrical), 1 c.c.

Pituitary Extract-Lilly (Surgical)

Pituitary Extract-Lilly (Surgical), 1 c.c.

MEDICAL LABORATORIES, INC.:

Culture Bacillus Acidophilus-Medical Laboratories, Inc.

MERCK AND COMPANY:

Barbital-Merck

Barbital Sodium-Merck

Carbon Tetrachloride-Merck Highest Purity "C.P."

H. K. MULFORD COMPANY:

Cargentos Capsules, 3 grains

Cargentos Ointment, 5 per cent

Diphtheria Toxin-Antitoxin Mixture New Formula
(Park Banzhaf 0.1 L+ Dose)-Mulford

NUTRIVOID DIABETIC FLOUR COMPANY:

Nutrivoid Flour

PARKE, DAVIS AND COMPANY:

Antidysenteric Serum-P. D. and Co., 20 c.c. syringe

POWERS-WEIGHTMAN-ROSENGARTEN COMPANY:

Quinine Ethyl Carbonate-P. W. R.

NEW AND NON-OFFICIAL REMEDIES

Meroxyl.—A mixture containing approximately 50 per cent of the sodium salt of 2,4-dihydroxy-3,5-dihydroxymercibenzenophenone-2-sulphonic acid, with foreign matter containing ammonium 2,4-dihydroxy-benzophenone-2-sulphonate, sodium acetate and water. Meroxyl is a local antiseptic and germicide proposed for use in superficial infections. It is used for wet dressings of wounds, and also for irrigation of wounds and infected bladders. Meroxyl is marketed in the form of tablets containing 0.15 Gm. Hynson, Westcott and Dunning, Baltimore. (Jour. A. M. A., Oct. 4, 1924, p. 1079.)

Metaphen.—Bisacetoxymercuri-4-nitro-2-cresol. It contains from 58 to 60 per cent of mercury in organic combination. Metaphen is a germicide, more powerful than mercuric chloride and certain organic mercury compounds when tested on cultures of *Staphylococcus aureus* and *Bacillus typhosus*. It is stated to be relatively non-irritating when applied to mucous membranes or the skin, and to be without deleterious action on metallic instruments or rubber. Metaphen is proposed for use in the treatment of gonorrhea, infections of the eye, for skin sterilization and for sterilization of instruments and rubber. It is insoluble in water, and, for use, solutions must be prepared with the aid of sodium hydroxide. It is supplied in the form of metaphen solution 1:5,000. Abbott Laboratories, Chicago. (Journal A. M. A., Oct. 11, 1924, p. 1167.)

Sterile Ampules Mercury Benzoate 2 per cent, 1 c.c.—

Mercuric benzoate-N. N. R. (New and Non-official Remedies, 1924, p. 200), 0.02 Gm. (1/3 grain), in a solution of sodium chloride 2.5 per cent, 1 c.c. Swan-Myers Co., Indianapolis.

Sterile Ampules Mercury Succinimide, 0.01 Gm. (1/6 grain).—Mercuric succinimide-N. N. R. (New and Non-official Remedies, 1924, p. 204), 0.01 Gm., in water 1 c.c. Swan-Myers Co., Indianapolis.

Sterile Ampules Mercury Salicylate, 0.065 Gm. (1 grain).—Mercuric salicylate-U. S. P., 0.065 Gm.; benzocaine-N. N. R., 0.02 Gm., in neutral vegetable oil, 1 c.c. Swan-Myers Co., Indianapolis.

Sterile Ampules Mercury Salicylate, 0.097 Gm. (1 1/2 grain).—Mercuric salicylate-U. S. P., 0.097 Gm.; benzocaine-N. N. R., 0.02 Gm., in neutral vegetable oil, 1 c.c. Swan-Myers Co., Indianapolis.

Sterile Ampules Mercury Binioidide, 0.01 Gm. (1/6 grain) in oil.—Red mercuric iodide-U. S. P., 0.01 Gm. suspended in pure cottonseed oil, 1 c.c. Swan-Myers Co., Indianapolis.

Concentrated Tetanus Antitoxin (Globulin).—Tetanus antitoxin, concentrated (New and Non-official Remedies, 1924, p. 297), marketed in packages of one syringe containing 10,000 units; in packages of one syringe containing 20,000 units; in packages of one cylinder containing 5,000 units for intraspinal use; in packages of one cylinder containing 10,000 units with intravenous outfit. Lederle Antitoxin Laboratories, New York.

Antipneumococcus Serum, Type 1.—Antipneumococcus serum (New and Non-official Remedies, 1924, p. 304), marketed in packages of one cylinder containing 100 c.c. with intravenous outfit; in packages of one vial containing 100 c.c. Lederle Antitoxin Laboratories, New York.

Antistreptococcic Serum, Polyvalent.—Antistreptococcic serum (New and Non-official Remedies, 1924, p. 305), marketed in packages of one syringe containing 20 c.c.; in packages of three 10 c.c. vials; in packages of one vial containing 50 c.c.; in packages of one vial containing 100 c.c.; in packages of one cylinder containing 100 c.c. with intravenous outfit. Lederle Antitoxin Laboratories, New York.

Acne Vaccine.—Acne vaccine (New and Non-official Remedies, 1924, p. 316), marketed in packages of four vials containing respectively 5, 10, 20 and 40 million killed acne bacilli; in packages of one 5 c.c. vial containing 40 million killed acne bacilli per c.c.; in packages of one 10 c.c. vial containing 40 million killed acne bacilli per c.c. Lederle Antitoxin Laboratories, New York. (Journal A. M. A., Oct. 18, 1924, p. 1245.)

Staphylococcus Vaccine Polyvalent-Lederle.—Staphylococcus Vaccine (New and Non-official Remedies, 1924, p. 324), marketed in packages of one 5 c.c. vial containing 800 million killed *Staphylococcus albus*, 800 million killed *Staphylococcus aureus* and 400 million killed *Staphylococcus citreus* per c.c.; in packages of one 10 c.c. vial, containing 800 million killed *Staphylococcus albus*, 800 million killed *Staphylococcus aureus* and 400 million killed *Staphylococcus citreus* per c.c. Lederle Antitoxin Laboratories, New York.

Pneumococcus Vaccine Polyvalent-Lederle.—Pneumococcus vaccine (New and Non-official Remedies, 1924, p. 322), marketed in packages of one 5 c.c. vial containing 3,000

million killed pneumococci per c.c. Lederle Antitoxin Laboratories, New York.

Typhoid Vaccine (for prophylactic treatment)-Lederle.—Typhoid vaccine (New and Non-official Remedies, 1924, p. 326), marketed in packages of 30 vials; in packages of one 5 c.c. vial containing 1,000 million killed typhoid bacilli per c.c.; in packages of one 20 c.c. vial containing 1,000 million killed typhoid bacilli per c.c. Lederle Antitoxin Laboratories, New York.

Typhoid combined vaccine prophylactic-Lederle.—Typhoid vaccine (New and Non-official Remedies, 1924, p. 326), marketed in packages of 30 vials; in packages of one 5 c.c. vial; in packages of one 20 c.c. vial. Lederle Antitoxin Laboratories, New York. (Journal A. M. A., Oct. 25, 1924, p. 1335.)

PROPAGANDA FOR REFORM

Some "Mixed" Vaccines of G. H. Sherman Not Accepted for N. N. R.—The Council on Pharmacy and Chemistry reports that the following "mixed" vaccines of the firm of G. H. Sherman were found to be unacceptable for New and Non-official Remedies: Erysipelas Vaccine No. 1, Pneumo. Mixed Vaccine No. 6, Strepto. Staph. Vaccine No. 10, Colon Bacillus Combined Vaccine (Modified Van Cott) No. 35, Friedlander Vaccine No. 36, Influenza Vaccine No. 38, Catarrhal Vaccine No. 40, Whooping Cough Mixed Vaccine No. 43. As evidence for these "mixed" vaccines the firm submitted a printed brochure: "Data on the Use of Mixed Bacterial Vaccines." Part of the data consisted chiefly of the reproduction of letters from physicians—some of them men of high standing—testifying to the value of "mixed" vaccines in various conditions. The other part of the data consisted of abstracts or reprints of articles which have appeared in medical publications. This evidence the Council found unacceptable. The evidence for the several vaccine mixtures under consideration did not establish the rationality of any of them. On the contrary, their use is bound to lead to haphazard therapy—particularly so, because the trend of the Sherman advertising which accompanies the products is toward the use of vaccine mixtures. This includes a complete line of Sherman vaccines and contains a long list of diseases with recommendations for the use of vaccines, generally referred to by numbers rather than by names descriptive of their composition. (Journal A. M. A., Oct. 11, 1924, p. 1184.)

Jack Sprat Bread, Another Obesity Cure Fake.—This bread is put on the market by Charles Sulzer and Co., Chicago, and proclaimed by Sulzer to be "My Magical Discovery." It is said to be "rich in protein" and "unusually low in starch." It is claimed ". . . easily and pleasantly Jack Sprat restores the beauties of form and features." Analysis shows that Jack Sprat Bread has between 29 and 33 per cent of starch and a total carbohydrate content of 36 to 40 per cent. It seems to be a very ordinary product which is a hybrid between a gluten and a whole wheat bread. The statement that the bread is unusually low in starch content is false. It is not true, as claimed, that the obese can reduce by eating all they want, whenever they want it. The claim that "Nothing can reduce you as Jack Sprat will" is sheer quackery. (Journal A. M. A., Oct. 18, 1924, p. 1261.)

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

MEETING OF OCT. 15, 1924

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, October 15, 1924, at 8 p. m. having been postponed one week on account of the meeting of the State Society. The meeting was called to order by the President, Dr. H. P. Ritchie. There were 27 members present.

The minutes of the September meeting were read and approved.

A committee consisting of Drs. Arnold Schwyzer, H. B. Sweetser and John F. Fulton was appointed by the President to draw up suitable resolutions on the death of Dr. Archibald MacLaren, a former president of the Academy.

There were no papers read at this meeting, but the following members reported cases:

DR. HARRY ZIMMERMAN (St. Paul) reported a case of supposed hernia, which at operation proved to be angiosarcoma.

DISCUSSION

DR. A. SCHWYZER: In connection with this interesting case I want to report a case of angiosarcoma in the region of the upper part of the sternum and mediastinum. The man was exceedingly cyanosed and the veins of the neck were distended. He was blue and had had to remain in sitting posture day and night for several weeks. The bulging area was about 10 cm. in diameter and was spongy. At the periphery there were large veins running in all directions. I thought if I could get some radium into the center of that mass I could do most good and save the skin over it. We made a quick incision, packed gauze with 50 milligrams of radium in tightly as quick as the incision was made, but the loss of blood was severe for a short time. We left the radium in the first time only seven hours. A few days later the radium was put in again, this time for 24 hours. When we removed that radium the bleeding was very much less than we had expected though we had entered the sternum with a rongeur forceps at the second session. We waited again about a week and then we went in again, this time through the sternum into the anterior mediastinum. Radium was put in now for 48 hours. The same dose was given two weeks later. It was amazing how that tendency to bleeding had disappeared. He had had in all 8,600 milligram hours. He did very well and went home happy. In fact the condition looked much improved. About three months later he died of what was declared pneumonia.

The effect of radium in angiosarcoma is wonderful, especially if you can get the radium into the center.

DR. R. E. FARR (Minneapolis) reported the following case:

Mr. N. J. L., aged 59, entered St. Mary's Hospital on June 1, 1924, giving the following history:

Left sided hernia for 26 years. About one year ago hernia seemed to disappear for about nine months. Two or three weeks ago patient slipped on a banana peel and immediately noticed bulging in left scrotum. Severe pain for six or seven days. Since that time has had frequent urination day and night with burning. The urine contains a large amount of pus. Patient feels that he empties the

bladder better if he lifts the hernia sac upward, pressing its contents into the abdomen.

June 2, 1924, sacral anesthesia, 70 c.c. of 1 per cent was administered. The bladder was found to contain 75 c.c. of cloudy urine which contained much pus. The bladder was distended with air and with the patient standing a cystogram was made. Cystoscopic examination showed a marked cystitis with a large diverticulum to the left.

On July 17th the patient was operated upon under local anesthesia. The hernia contained nothing excepting the bladder, which was dissected free and returned to the abdomen. The abdominal wall was reconstructed. The radiogram showed the normal contour of the bladder with a compartment about equal to that in the left scrotum. This radiogram was confirmed by one made with sodium bromide solution. A third radiogram shows a sodium bromide cystogram of the bladder after operation. Diverticulum seems to have disappeared—the outline of the bladder being perfectly normal.

DISCUSSION

DR. A. SCHWYZER: Did this come out like a hernia?

DR. FARR: I think this patient had a direct hernia and a diverticulum of the bladder. One point which I did not mention in reporting the case relates to his cystitis. We were unable to overcome his bladder infection by irrigations before operation and yet directly after operation when the bladder emptied completely the infection disappeared.

DR. H. B. SWEETSER (Minneapolis) reported the following case: I would like to report a case which shows that if you have your mind fixed on one thing you may forget the real thing. We had a man who had an abscess of the prostate three or four weeks ago, with a high leucocyte count. We opened the abscess through the perineum. He improved and got along very well for about ten days and then he had a very severe hemorrhage. He went along and was very well again until last Thursday or Friday when he had another quite severe hemorrhage. It saw him then and packed the cavity, and there was just one little spot where the packing was efficient. Early Sunday morning he had another quite severe hemorrhage and when Dr. T. H. Sweetser got down to the hospital the man had already lost a lot of blood.

I had supposed it was like the cases of secondary hemorrhage we had in the old days when I was an intern, due to suppuration.

On Monday morning his mother was at the hospital and she said, "I am a bleeder and my daughter is a bleeder." Also she told us the patient had had his tonsils out about a year ago, and, after he had gone home, he had a hemorrhage which required packing to control.

On Monday we tried to ascertain the bleeding time and let it bleed for 50 minutes and then had to stop it. We gave him 20 c.c. of whole blood under the skin, and yesterday his clotting time was 3 minutes.

I had entirely lost sight of the fact that this might be a case of hemophilia.

DR. H. L. ULRICH (Minneapolis) reported a case of subacute bacterial endocarditis, and showed x-ray films and specimen.

Because of some of the unusual features this case is reported. A Swede, 35 years old, a laborer, some ten months in this country, entered the General Hospital July 18, 1924, complaining of recurrent colds of seven months' standing, fatigability seven months, anorexia two months, occasional chill, and edema of the ankles for one month. There has been no loss of weight.

The past history is practically negative. He had noticed some rheumatic pains in the left hip and shoulder for the past three years, had diphtheria at seven. Denies venereal disease. Family history and social history of no significance.

On entrance his physical examination revealed the following positive findings: some pallor of the skin and mucous membranes, marked pyorrhea, throat injected, tonsils enlarged. Some variation in breath sounds in the right lower chest. Heart is not enlarged, apex beat is forcible and a thrill is felt over this area. Mitral tone is loud and distant, the first being split and roughened. Liver is not enlarged, but the spleen is easily palpable and firm but not tender. Blood pressure 104-50. Temperature 101-99. Blood picture: R. B. C. 3,140,000; hemoglobin 63%, W. B. C. 5,000. P. M. N. 57%, Lymph. 29%, Large mononuclear 9%, eosinophil 1%. Urine amber, acid, specific gravity 1.008, albumen present, no sugar. Hyaline, granular casts, many R. B. C., and a few leucocytes present.

Four days after admission he developed severe abdominal pain and diarrhea. On the fifth day a pustular rash developed on the face and neck, wrists and hands.

Up to this time the tentative diagnosis had been: endocarditis, pulmonary tuberculosis, typhoid fever, tuberculous enteritis, possible T. B. kidney. Owing to the pustular eruption the patient was quarantined as a smallpox subject. The dermatologists, however, made a diagnosis of erythema multiforme. During this period his temperature had been above normal, varying between 102-99. On August 12, some three weeks after his admission, the patient was returned to my service. His temperature had been normal since July 29th. His heart presented a moderate enlargement to the right and left, with a diffuse wavy impulse and a thrill in the fifth interspace inside of the apical area. At the left of the sternum there was a loud harsh diastolic murmur. The spleen was easily felt. Skin of the face was clearing. There was some pigmentation of the face, also of the wrists and hands.

X-ray report of the heart, six-foot plate at about this time: total diameter 15 cm., cardiac enlargement, aortic or hypertension type, probably aortitis. During this period the blood showed the characteristic picture of secondary anemia, hemoglobin from 49% to 38%, reds, 2,800,000 to 2,500,000, leucocytes from 5,000 to 2,700. On August 25th blood chemistry showed: creatinine 2.6 mgms., urea nitrogen 59.9 mgms. Uric acid 6.8 mgms. Van Slyke 40%, Van der Bergh negative. Urine was of low specific gravity, casts, albumen, and R. B. C. present. Blood cultures were repeatedly negative.

The heart was of interest. The major lesion which centered around the aortic valve, the configuration of the heart, and auscultation definitely determined this. Yet there was a marked palpatory thrill inside of the apex, presystolic in time, a presystolic crescendo rumble ending in a snappy

first sound followed by a systolic murmur made some of the clinicians early in the study center the major lesion in the mitral valve. While the aortic lesion was convincing, the stenotic noise and palpatory thrill either spoke for a stenosis of the mitral or a Flint murmur. If a Flint murmur, it was the loudest and most pronounced thrill produced by a Flint ever felt in our wards. Its localization inside of the apex made the suggestion of a Flint more probable than that of a true mitral stenosis. The general condition of the patient meanwhile was fairly good. His appearance improved. He occasionally had a temperature slightly above normal.

The diagnosis of bacterial endocarditis with embolic nephritis was suggested. The absence of bacteria in the blood and at no time petechiæ, are striking factors. On September 11th he developed a severe chill with a temperature of 106. Early September 12th he died.

Necropsy was performed by Dr. Kano Ikeda, of which the following description of findings are excerpted.

A few petechial hemorrhages in the conjunctiva. The peritoneal cavity contains 500 c.c. clear amber fluid. Pleural cavities clear, no adhesions. The pericardial sac contains 100 c.c. clear fluid. The heart weighs 500 grams, transverse width 17 cm., there are a few petechial hemorrhages over the epicardium of the right auricle, the ventricles are dilated. At the aortic orifices the left and right semilunar valves are apparently fused. They are thickened and show irregular yellowish soft vegetations 1x1x2 cm. at the free edges extending downward into the ventricular cavity. There are numerous small vegetative nodules. There is an irregular ulceration of the mural endocardium below the left semilunar valve. The coronaries are patent. The rest of the aorta contains a few yellowish plaques. The lungs are clear. The spleen weighs 730 gms. The capsule is adherent to the surrounding structure. It is tough and shows areas of fibrositis. On section the pulp is dark red and scrapes easily. In the superior pole of the spleen there is an infarct 2 cm. in diameter. The corpuscles are prominent and trabeculae are distinct. The gastrointestinal tract is negative. The pancreas and adrenals are negative. Left kidney weighs 240 gms., the right 230 gms. The capsules strip readily, leaving smooth surfaces with gray and red mottlings. There are minute pin-point dark spots on the surface. On section the surface is mottled, cloudy and swollen. The bladder and genitalia are normal. Head was not examined. Blood culture from the heart negative after three weeks.

Diagnoses: Subacute bacterial endocarditis. Aortic valvulitis. Infarct of spleen—perisplenitis. Cloudy swelling of liver and kidneys. Embolic glomerulonephritis. Ascites. Splenomegaly.

Microscopic sections of the heart through the aortic valve show gram positive cocci, probably streptococci (?). Heart muscle shows diffuse invasion of P. M. N., particularly surrounding the blood vessels, probably embolic myocarditis. Kidneys show diffuse embolic glomerulonephritis. Liver shows early passive congestion. Spleen shows infarcts and passive congestion.

This case differs in certain details from the usual type of subacute bacterial endocarditis. The marked erythematous lesion of the skin, the absence of bacteria in the blood, the

absence of petechiæ until the terminal event are striking. It differs from Libman's aberrant type with skin lesions in that the lesion in the heart is not verrucous, in the absence of pericardial or pleuropericardial lesions and in the absence of petechiæ.*

DISCUSSION

DR. S. E. SWEITZER: This very interesting case reported by Dr. Ulrich came in on the medical side and I first saw him in consultation in the contagious ward, where a diagnosis of phlegmon of the face had been made. He was sent in for smallpox. In one or two days the condition arrived at a stage which showed tremendous edema of the face, including the eyelids, a bullous eruption of the neck, an eruption on the backs of the hands, both large and small lesions. There were hemorrhagic crusts over the nose and around the mouth. Ordinarily we would figure that this man had either a drug rash, smallpox, or erythema multiforme. I had a number of my colleagues see him and each one made a different diagnosis so I stood alone in my diagnosis of erythema multiforme. I thought he had some extreme type due to some virulent organisms. We have long looked upon erythema multiforme as due to various causes. In this particular instance it was septic endocarditis.

While in the contagious ward we placed him on large doses of salicylates and he began to improve immediately. After his skin cleared up sufficiently to send him back to the general ward he did not do so well, and died in about three weeks.

DR. A. SCHWYZER (St. Paul) reported the following case: Dr. Sweetser's case reminds me of a wrong diagnosis I made three weeks ago on a patient. I had thought he had definitely a carcinoma of the stomach. When he was brought into the hospital his hemoglobin was 40. He had bled very copiously from the stomach and intestines and had not been feeling well for two or three months. When you put your hand lightly on the epigastrium you could feel a boggy hard mass about 2 inches wide all the way across the epigastrium, just exactly like carcinoma. It moved with respiration. We wanted to see what we could do for him and made an incision. He had bled so much that we had not dared to take a roentgenogram and thought an exploratory operation would be the best to help us out.

Under local anesthesia we opened the abdomen. The small intestines were pale and flabby, but there was one very dark red, almost black, small intestinal loop. Its peritoneal covering was not glossy any more but somewhat roughened. There were in the corresponding mesentery little streaks of blood and the whole loop felt fleshy and thick. We had here undoubtedly a thrombosis but not a large complete infarct. About 2 cm. away from the gut the mesentery was normal. The attachment of the mesentery was dark red and thick. In pulling down the omentum we found the whole transverse colon big, thick and solid, dark red, but not completely black. No marked edema with it. The surface was not shiny as it is normally. The whole colon was firm and this was the mass we had felt. At the periphery of this area there were streaks of suffusion. About 3 cm. down on the transverse mesocolon the discoloration

ceased. On the stomach itself there was nothing to be seen except on the greater curvature a few small subperitoneal hemorrhages. Apparently we had only small but multiple radicular thromboses in these areas of the portal system.

We closed the abdomen up and gave him Bulgarian sour milk. He had to have something, as he had been starved for 3 or 4 days before entering the hospital. The recovery was surprisingly smooth. The patient is all right now. I thought this was interesting, for the infarction was not only in the transverse colon but also in the loop of jejunum. There had been no fever. It was a degree of infarction which, notwithstanding the marked palpatory findings and discolorations, did not completely obstruct the circulation. Small nicks with the knife had shown bleeding.

I might add that the black vomit after operations, especially on the omentum, is also considered to be due to this form of radicular thrombosis in the portal system.

The meeting adjourned.

JOHN E. HYNES, M.D.,
Secretary.

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

INTERNATIONAL CLINICS. Vol. III. Thirty-fourth series, 1924. Edited by Henry W. Cattell, A.M., M.D., Philadelphia, in collaboration with others. 304 pages. Illus. Philadelphia: J. B. Lippincott Co., 1924.

OPERATIVE SURGERY. Alfred T. Bazin, D.S.O., M.D., Asst. Prof. of Surgery and Clinical Surgery, McGill University, Montreal, Canada. 126 pages. Cloth, \$2.50. Montreal: Renouf Publishing Co., 1924.

THE ROCKEFELLER FOUNDATION. ANNUAL REPORT, 1923. 389 pages. Illus. New York: The Rockefeller Foundation Press, 61 Broadway, New York, 1924.

FUNDAMENTALS OF HUMAN PHYSIOLOGY. R. G. Pearce, B.A., M.D., formerly director Medical Research Laboratory, Lakeside Hospital, Cleveland, O., formerly Asst. Prof. of Physiology, Univ. of Illinois, Chicago; and J. J. R. MacLeod, M.B., D.Sc., F.R.S., Prof. of Physiology, Univ. of Toronto, Canada, formerly Prof. of Physiology, Western Reserve Univ., Cleveland, O. 3rd edition. 349 pages. Illus. Cloth, \$3.50. St. Louis: C. V. Mosby Co., 1924.

MATERIA MEDICA FOR NURSES. A. L. Muirhead, M.D., late Prof. of Pharmacy, Creighton Univ., Omaha, and Edith P. Brodie, A.B., R.N., Institute of Materia Medica and Therapeutics, Washington Univ. School for Nurses. 2nd edition. 190 pages. Illus. St. Louis: C. V. Mosby Co., 1924.

THE FOUNDATION OF HEALTH. A Manual of Personal Hygiene for Students. William Barnard Sharp, S.M., M.D., Ph.D., Prof. of Bacteriology and Preventive Medicine in the Medical Department of the University of Texas, Galveston. 256 pages. Illus. Cloth, \$2.50. New York and Philadelphia: Lea & Febiger, 1924.

BASAL METABOLISM IN HEALTH AND DISEASE. Eugene F. DuBois, M.D., Medical Director, Russell Sage Institute of

*A. Hitherto Undescribed Form of Valvular and Mural Endocarditis. Emanuel Libman and Benjamin Sachs. Arch. of Int. Med., June 15, 1924, p. 701.

- Pathology; Associate Prof. of Medicine, Cornell University Medical College. 372 pages. Illus., with 79 engravings. Cloth, \$4.75. New York and Philadelphia: Lea & Febiger, 1924.
- PATHOGENIC MICROORGANISMS.** A Practical Manual for Students, Physicians and Health Officers. Wm. Hallock Park, M.D., Anna Wessels Williams, M.D., and Charles Krumweide, M.D. 8th edition, enlarged and revised. 811 pages. 211 engravings and 9 full page plates. Cloth, \$6.50. New York and Philadelphia: Lea & Febiger, 1924.
- PRINCIPLES OF BIOCHEMISTRY.** For Students of Medicine, Agriculture and Related Sciences. T. Brailsford Robertson, Ph.D., D.Sc. 2nd edition, thoroughly revised. Illus., with 57 engravings. Cloth, \$8.50. New York and Philadelphia: Lea & Febiger, 1924.
- ANATOMY OF THE HUMAN BODY.** Henry Gray, F.R.S., Fellow of the Royal College of Surgeons; Lecturer on Anatomy at St. George's Hospital Medical School, London. 21st edition, thoroughly revised and re-edited by Warren H. Lewis, B.S., M.D. 1,417 pages. Illus., with 1,283 engravings. Cloth, \$10.00. Philadelphia and New York: Lea & Febiger, 1924.
- THE PHYSIOLOGY OF EXERCISE.** A Text Book for Students of Physical Education. James Huff McCurdy, A.M., M.D., M.P.E., Director of Physical Education course in the International Young Men's Christian Association College, Springfield, Mass.; Editor of American Physical Education Review. 242 pages. Illus. Cloth, \$3.00. New York and Philadelphia: Lea & Febiger, 1924.
- ORGANOTHERAPY IN GENERAL PRACTICE.** 253 pages. Illustrated. New York: G. W. Carnrick Co., 1924. \$2.00.
- This volume has been put out by the G. W. Carnrick Company, of New York City, and is offered to the profession. The author's name is conspicuous by its absence. An anonymous volume of any kind lacks authority and when it is produced by a commercial house it is naturally received with hesitation, to say the least.
- The following appears under the heading "Insulin in Treatment": "For the routine treatment of diabetes of the mild or moderately developed type, extending over years, the daily or twice daily injection of an expensive product has failed to meet the requirements. Oral administration appears to be the only satisfactory method for this long continued treatment in the home. Numerous extracts have been prepared for oral administration and have proved successful in reducing blood sugar and correcting disturbed carbohydrate metabolism. Berkeley, Wallis, Achard and others have prepared extracts which gave good results clinically and Banting and Best and Murlin have given experimental evidence of the value of such extracts by administration through the stomach. No pancreas preparation, however, has received as extensive clinical trial as Trypsogen."
- The occurrence of such an obviously unfounded statement in a work of this sort further discredits the entire volume. Physicians and not commercial houses should be the authorities on therapeutics.
- C. B. DRAKE, M.D.

ULTRA-MODERN HOME in Lynnhurst district, Minneapolis, formerly occupied by physician and ideal for member of medical profession, will be sacrificed if sold this month by out-of-town owner. On corner lot, with beautiful lawn, trees and shrubbery, home is eight-room tapestry brick and kragstone bungalow. First floor has large living room, brick fireplace, built-in features; large dining room with built-in buffet; two large bedrooms, French windows; breakfast room with French windows on three sides; white enamel kitchen and gas and coal combination range; large porch with pagoda roof. Basement has amusement room, daylight laundry, separate work, vegetable, boiler and coal rooms, and fireproof garage. Hot water heating system. Upstairs has large guest room, maid's room, washroom with running water. For information or appointment, call Mr. Kaufman, Main 1798, or write H. H. Kaufman, 1606 Oliver Ave. N., Minneapolis.

THE MINNEAPOLIS GENERAL HOSPITAL offers a Technician's Course in x-ray to women having high school diplomas. Course covers a period of eight months. Diploma is issued upon completion of the course. Noon meal furnished. Address Minneapolis General Hospital, Minneapolis, Minn.

McDANNOLD SURGICAL CHAIR—Send for circular and big discount. A. McDannold Chair Co., 1416-18 N. Sarah St., St. Louis, Mo.

A PRACTICAL COURSE IN STANDARDIZED PHYSIOTHERAPY, under auspices of Biophysical Research Department of Victor X-Ray Corporation, is now available to physicians. Offers a highly practical knowledge of all the fundamental principles that go to make up the standards of modern scientific physiotherapeutic work. Course requires one week's time. For further information apply to J. F. Wainwright, Registrar, 236 South Robey Street, Chicago, Ill.

EXCELLENT LOCATION for physician in new building at 3805 Nicollet avenue, Minneapolis. Fine new heated apartment, four rooms and bath, can be had in conjunction. Reception room with dentist. For information call Colfax 2754.

WANTED—To buy an unopposed practice in Minnesota by a physician and surgeon. Address C-9, care MINNESOTA MEDICINE.

MEDICAL DOCTOR WANTED at once in city of 4,000 population. Community hospital, good territory. For particulars write Mlinar Drug Store, Hutchinson, Minn.

MINNEAPOLIS OFFICE SPACE TO SUBLET—Very desirable office space at 323 La Salle Bldg., Minneapolis, to be sublet by Drs. Willson, Cabot and Wohlrahe. For information call at office or telephone Main 3220.

Minnesota State Medical Association

ANNUAL MEETING

October 8, 9 and 10, 1924

ST. CLOUD, MINNESOTA

MINNESOTA STATE MEDICAL ASSOCIATION
MINUTES OF THE FIFTY-SIXTH ANNUAL
MEETING HELD IN ST. CLOUD, OCTOBER
8, 9 AND 10, 1924

PROCEEDINGS OF HOUSE OF DELEGATES

FIRST SESSION—WEDNESDAY, OCTOBER 8, 1924

The House of Delegates held its first meeting Wednesday afternoon in the Knights of Columbus Hall, with the First Vice President, Dr. E. T. Sanderson, Minneota, in the chair.

THE CHAIRMAN: You will please come to order while Dr. Drake reads a communication from Dr. MacLaren, our President.

THE SECRETARY: The following is a communication which Dr. MacLaren asked to be read before the meeting of the State Association:

It is with feelings of the deepest regret that I find it will be impossible for me to attend the meeting of the Minnesota State Medical Association at St. Cloud. Never having suffered from a severe illness before, it has seemed, from week to week, that I would surely be able to be with you at this time. In this hope, however, I am doomed to disappointment in spite of the excellent care given me by my skillful medical advisors. They assure me that before long I shall be out again and then it will be with the most heartfelt pleasure that I shall greet my old friends again. I wish to express, at this time, my keenest interest in the meeting and to send to you my best wishes for its great success.

DR. ARCHIBALD MACLAREN.

THE CHAIRMAN: I will appoint a committee to pass on the credentials of delegates: Dr. Condit, Dr. Braasch, and Dr. Gray; and we will stand at ease until the Credentials Committee reports.

(Upon motion, duly seconded and carried, the Minutes of the last meeting of the House of Delegates as published in MINNESOTA MEDICINE in the December, 1923, issue were accepted.)

THE CHAIRMAN: I will call upon Dr. Workman to present the recommendations of the Council and the Treasurer's Report incorporated in the Report of the Auditors of the accounts of the Association.

REPORT OF THE COUNCIL

The Council of the Minnesota State Medical Association convened at 11 o'clock, October 8, 1924, in the Knights of Columbus Club Rooms, St. Cloud, Dr. W. H. Workman, president of the Council, presiding. All members with the exception of Dr. Weiser, who was absent on account of illness, were present. Dr. E. T. Sanderson, first vice president, attended in the capacity of president in place of Dr.

Archibald MacLaren, and Dr. Carl B. Drake, secretary, was also present.

Dr. E. T. Sanderson was authorized to preside at the various meetings of the Association during the time of the convention to take the place of Dr. MacLaren, who was unable to attend because of illness. A communication from Dr. MacLaren was then read.

It was voted to approve the expenditure of \$175.00 in payment of expenses incurred in presenting a health exhibit at the 1924 State Fair, held in St. Paul in September.

The report of the Executive Secretary, which included the report of the auditor, Mr. Flesher, was then given by Mr. Bruce. This was followed by the report of the treasurer, Dr. F. L. Beckley. Both reports were approved by the Council, to be published with the regular transactions of the meeting.

The question of whether or not the Society should continue to give medical defense to members of the Association was discussed, but no definite action was taken on the matter.

Dr. Braasch then introduced the question of providing for a full time executive secretary, who would receive a definite salary for handling the affairs of the Association, to devote all his time to the interests of the Association. Upon motion to that effect, the president of the Council was asked to appoint a committee, to include himself, of three members, to bring this matter before the House of Delegates. Dr. Workman then appointed Dr. Braasch and Dr. Drake to act in conjunction with himself in this capacity.

Dr. Drake read the Secretary's report in which he included his resignation as secretary to become effective at the close of the present calendar year. The report was approved and Dr. Drake's resignation was accepted with an appreciation of his services for the past four years, which was voiced in the form of a motion made to the Council by Dr. Braasch.

Dr. Burnap then presented the matter of physicians' accepting contract fees from organizations for medical service rendered individuals belonging to such organizations, dealing particularly with the question raised by the Red River Valley Medical Society with respect to the Order of Eagles. It was recommended that the individual local medical societies adjust matters of this kind as they deemed best in each case brought to their attention. The motion was seconded and carried.

The matter of providing for physicians who have become incapacitated or are in straightened circumstances was brought before the Council by Dr. Drake. It was the consensus of opinion that this matter should be taken up with the House of Delegates.

The question of providing a circulating medical library for the use of the profession in the state was discussed but no action was taken inasmuch as the president stated that plans were now being made at the State University which would undoubtedly take care of an arrangement of this nature.

The Council then adjourned to meet immediately after the House of Delegates, Thursday morning.

H. M. WORKMAN.

REPORT OF THE AUDITORS
MINNESOTA STATE MEDICAL ASSOCIATION
SAINT PAUL, MINNESOTA

AUDIT REPORT
OCTOBER 10, 1923, TO OCTOBER 4, 1924

October 6, 1924.

Minnesota State Medical Association,
J. R. Bruce, Secretary,
Saint Paul, Minnesota.
Gentlemen:

In accordance with your request, we have made a Balance Sheet audit of the books and records of the Minnesota State Medical Association for the period October 10, 1923, to October 4, 1924, and we present our report in the following Exhibits and accompanying comments:

- EXHIBIT A—STATEMENT OF ASSETS, LIABILITIES AND NET WORTH AS OF OCTOBER 4, 1924.
- EXHIBIT B—STATEMENT OF INCOME AND PROFIT AND LOSS FOR THE PERIOD OCTOBER 10, 1923, TO OCTOBER 4, 1924.
- EXHIBIT C—TREASURER'S REPORT OF THE CASH RECEIPTS AND DISBURSEMENTS FOR THE PERIOD OCTOBER 10, 1923, TO OCTOBER 4, 1924.
- EXHIBIT D—STATEMENT OF OPERATIONS OF MINNESOTA MEDICINE PUBLICATION, OCTOBER 10, 1923, TO OCTOBER 4, 1924.

The above statements were prepared from your books, and the items on the Balance Sheet were verified by actual inspection in the case of the bonds, a check of the bank statements, and a verification of the accounts receivable. A list of the accounts receivable was furnished us and the executive secretary advised all the accounts were considered good and collectible.

On account of the short time allotted for this audit, it was deemed best not to insist on a physical inspection of the Northern Pacific Bonds shown on the Balance Sheet at \$4,000.00, as they were in a safety deposit box in a bank considerably removed from the office of the Treasurer, although he stated, if we so desired, he would secure them for our examination.

The accrued salaries payable consist of salaries due two of the officers of the association, which were not paid due to an oversight. All other liabilities have been paid.

EXHIBIT A—BALANCE SHEET: This statement sets forth the financial condition of the Association as of October 4, 1924. The Net Worth of the Association has increased from \$14,320.27 October 10, 1923, to \$14,845.00 October 4, 1924.

EXHIBIT B—STATEMENT OF INCOME AND PROFIT AND LOSS: This statement shows the result of operations of the Association for the period under review, whether or not the receipts or expenses have actually been paid out in cash. This was not possible last year, as the books were not on a double entry and accrual basis. It is now possible to show actual results.

EXHIBIT C—TREASURER'S REPORT: This statement shows the actual cash receipts and disbursements made by the Treasurer during the year, and the balance of cash on hand October 4, 1924.

EXHIBIT D—STATEMENT OF OPERATIONS OF THE MINNESOTA MEDICINE PUBLICATION: This statement is compiled for the purpose of showing the financial result of operations of the Magazine, "MINNESOTA MEDICINE." Inasmuch as members do not pay directly for a subscription to the magazine, an amount of \$2.00 per member is allotted to the magazine to show the revenue it is entitled to from subscriptions.

WE HEREBY CERTIFY, That subject to the above comments, in our opinion the Balance Sheet, Exhibit A, presents the true financial condition of the Association at October 4, 1924, and the Income and Profit and Loss State-

ment shows the true result of operations for the period under review.

Respectfully submitted,
FLESHER, FLESHER & COMPANY,
(Seal) By BENJ. H. FLESHER.

EXHIBIT A	
MINNESOTA STATE MEDICAL ASSOCIATION	
BALANCE SHEET AS OF OCTOBER 4, 1924	
ASSETS	
Cash in Banks:	
Minnesota Transfer State.....	\$ 1,082.50
Merchants National	3.57
	\$ 1,086.07
Accounts Receivable	1,940.24
First Mortgage Real Estate Bonds.....	7,700.00
Northern Pacific Railway Bonds.....	4,000.00
Furniture and Fixtures.....	\$ 354.10
Less: Allowance for Depreciation.....	35.41
	318.69
Total Assets	\$15,045.00
LIABILITIES	
Accrued Salaries Payable.....	\$ 200.00
NET WORTH	
Investment to October 10, 1923.....	\$14,320.27
Net Income per Exhibit B.....	524.73
Total Net Worth	14,845.00
Total Liabilities and Net Worth.....	\$15,045.00

EXHIBIT B	
MINNESOTA STATE MEDICAL ASSOCIATION STATEMENT OF INCOME AND PROFIT AND LOSS, OCTOBER 10, 1923, TO OCTOBER 4, 1924	
INCOME:	
Membership Dues	\$ 9,900.00
Advertising	7,628.10
Subscriptions	342.10
Interest on Investments.....	619.00
Interest on Bank Balances.....	78.53
Total Gross Income.....	\$18,567.73
EXPENSE:	
Publication of Magazine.....	\$11,271.66
Legal Expense	3,739.25
Salaries	1,400.00
Convention Expense	1,049.82
Display, State Fair.....	175.37
Council Stationery	30.00
Legislative Expense	9.21
Depreciation	35.41
Sundries	285.52
Discount	41.26
Interest Paid	5.50
Total Expense	18,043.00
Net Income for the Period.....	\$ 524.73

EXHIBIT C	
MINNESOTA STATE MEDICAL ASSOCIATION TREASURER'S REPORT, OCTOBER 10, 1923, TO OCTOBER 4, 1924	
Cash on Hand October 10, 1923.....	\$ 3,472.75
CASH RECEIPTS:	
Advertising	\$7,517.07
Subscriptions	334.25
Dues	9,910.00
Interest on Investments.....	619.00
Interest on Bank Balances..	78.53
Total Cash Received.....	18,458.85
Total Cash to be Accounted for.....	\$21,931.60

CASH DISBURSEMENTS:

Publication Expense	\$11,272.76
Legal Expense	3,739.25
Salaries	1,200.00
Convention Expense	1,049.82
Council Expense	205.37
Legislative Expense	9.21
Sundries	285.52
Refund on Membership Dues	10.00
First Mortgage Bond.....	3,000.00
Accrued Interest on Bond..	5.50
Filing Case	68.10

Total Cash Disbursements.....\$20,845.53
 Cash on Hand October 4, 1924.... 1,086.07

Total Cash Accounted for.....\$21,931.60

EXHIBIT D

MINNESOTA STATE MEDICAL ASSOCIATION STATE-
 MENT OF OPERATIONS OF MINNESOTA MEDI-
 CINE PUBLICATION, OCTOBER 10, 1923,
 TO OCTOBER 4, 1924

REVENUE:

Advertising	\$ 7,628.10
Subscriptions, Non-Members	342.10
Membership Subscription Allow- ance, 1,952 Members at \$2.00 each	3,904.00

Total \$11,874.20

EXPENSE:

Printing	\$ 4,970.31
Paper Stock	1,851.23
Editorial	1,695.14
Advertising Commission (Bruce Pub. Company)	1,524.84
Postage	160.00
Envelopes	143.15
Stenographic Service	660.00
Subscription Solicitation	99.85
Sundries	167.14

11,271.66

Net Gain for the Period October 10, 1923,
 to October 4, 1924 \$ 602.54

THE CHAIRMAN: If the Credentials Committee is ready to report we will listen to that now.

DR. CONDIT: There are 43 members present, which constitutes a quorum.

The following is a list of the delegates present:

Aitkin County	Dr. B. W. Kelly, Aitkin
Blue Earth County.....	Dr. Ralph T. Edwards, Elysian
Central Minn. District....	Dr. H. C. Cooney, Princeton
Clay-Becker County	Dr. W. H. Aborn, Hawley
Hennepin County	Dr. Geo. D. Head, Minneapolis
	Dr. W. A. Jones, Minneapolis
	Dr. Don. McCarthy, Minneapolis
	Dr. J. W. Bell, Minneapolis
	Dr. R. T. LaVake, Minneapolis
	Dr. J. G. Cross, Minneapolis
	Dr. J. C. Litzenberg, Minneapolis
	Dr. Chas. B. Wright, Minneapolis
Kandiyohi-Swift County..	Dr. C. L. Scofield, Benson
Meeker County	Dr. A. W. Robertson, Litchfield
Olmsted County	Dr. H. C. Bumpus, Rochester
	Dr. D. F. Hallenbeck, Rochester
	Dr. H. Z. Giffin, Rochester
	Dr. L. W. Pollock, Rochester
	Dr. V. C. Hunt, Rochester

Park Region	Dr. A. C. Baker, Fergus Falls
Ramsey County	Dr. F. C. Schuldt, St. Paul
	Dr. George Earl, St. Paul
	Dr. J. L. Martineau, St. Paul
	Dr. H. Buscher, St. Paul
	Dr. H. P. Ritchie, St. Paul
	Dr. George Geist, St. Paul
	Dr. A. Schulze, St. Paul
Red River Valley.....	Dr. G. S. Wattam, Warren
	Dr. H. M. Blegen, Warren
Redwood-Brown County..	Dr. F. D. Gray, Marshall
Rice County	Dr. F. S. Warren, Faribault
St. Louis County.....	Dr. W. A. Coventry, Duluth
	Dr. L. A. Barney, Duluth
	Dr. O. W. Parker, Ely
	Dr. B. S. Adams, Hibbing

Scott-Carver County	Dr. H. W. Reiter, Shakopee
Southwestern Minnesota ..	Dr. L. Sogge, Windom
Stearns-Benton County...	Dr. A. F. Moynihan, Sauk Center
Steele County	Dr. A. B. Stewart, Owatonna
Upper Mississippi	Dr. L. M. Roberts, Little Falls
Washington County	Dr. W. R. Humphrey, Stillwater
West Central Minn.....	Dr. B. M. Randall, Graceville
Wright County	Dr. E. A. Phillips, Delano

THE CHAIRMAN: Inasmuch as 20 constitute a quorum, we will declare the house duly constituted and will proceed with the business of the day. What will you do with the Auditors' Report?

(Upon motion, duly seconded and carried, the Report was accepted.)

THE CHAIRMAN: We will have the Secretary's Report, general and executive.

The Secretary read the following report:

SECRETARY'S REPORT

The active membership of the Association this date is 1,952. In addition to these, dues have been received from thirteen members, who have died during the year. There are also four honorary members. This makes a net gain of sixty-eight members over the membership reported a year ago. Following is a list of the membership by societies:

Aitkin County	6
Blue Earth County	32
Blue Earth Valley	24
Camp Release District.....	42
Central Minnesota District	16
Chisago-Pine County	15
Clay-Becker County	25
Dodge County	9
Freeborn County	16
Goodhue County	16
Hennepin County (1 deceased).....	454
Houston-Fillmore County	26
Kandiyohi-Swift County	18
Lyon-Lincoln County	18
McLeod County (1 deceased).....	17
Meeker County	10
Mower County	18
Nicollet-Le Sueur County.....	17
Olmsted County (1 deceased).....	237
Park Region (2 deceased).....	36
Ramsey County (2 deceased).....	301
Red River Valley	55
Redwood-Brown County	29
Rice County	24
St. Louis County	191
Scott-Carver County (2 deceased).....	14
S. W. Minnesota District.....	51

Stearns-Benton County (1 deceased)	47
Steele County (1 deceased)	13
Upper Mississippi (2 deceased)	70
Wabasha County	11
Waseca County	13
Washington County	14
Watonswan County	7
West Central	23
Winona County	20
Wright County	17

Total net membership (13 deceased)1,952
Grand total1,965

Legal expenses have been increasing from year to year and this year totaled \$3,739.25, which is about \$1,000.00 more than last year. Below is a statement of the amounts paid in each of the actions:

Doran vs. Mankato Clinic	\$ 77.00
Hadd vs. Schlutz	25.00
Singer vs. Bossingham	166.65
Krueger vs. Bossingham	66.60
Martinson vs. Boeckmann	40.00
Hanson vs. Schlutz	130.00
Johnson vs. Urstad	78.00
Korman vs. Hagen	299.15
Pickar vs. Pierce & McDonald	249.90
Ritter vs. Barber	207.00
Costenoble vs. Tanner	204.25
Korman vs. Hagen	279.02
Johnson vs. Shipley	213.30
Backlund vs. Burch	152.00
Elofson vs. Adkins	153.00
di Berardini vs. Vercellini et al.	127.00
Lorenz vs. Lerche	446.93
Godtland vs. Stewart	207.00
Marka vs. Andrews	399.80
Hawkes vs. Andrews	78.50
Pickar vs. Pierce	78.50
Expenses of Dr. Workman in obtaining evidence concerning Dr. I. S. Benson (not brought into court)	60.60
Total	\$3,739.25

Three of these cases are still pending. Of the actions listed in the attorneys' report three, of the total seventeen, are known to have had private insurance. In each instance this insurance was carried in the Fort Wayne Medical Protective Company. It is optional for members of the Association, in actions instituted against them for malpractice, to avail themselves of the service of the attorneys employed by the State Association regardless of whether or not they have private insurance and thus are entitled to defense through the attorneys of the insuring companies. It is a well deserved compliment to the abilities of the attorneys employed by the State Association that practically all our members ask for defense by the Association attorneys. The Fort Wayne Medical Protective Company sells insurance to our members at a very reasonable rate and for that reason it seems advisable to allow the present situation to continue. Attention is called to the fact that within the last two years, several very substantial verdicts have been obtained against members of the profession. This further emphasizes the desirability of members carrying insurance which covers the payment of damages. While the total fund paid for defense is considerable, when divided equally among the members it amounts to only about \$2.00 per capita.

The details of the work of the Association have been handled in a very businesslike manner in the office of the Executive Secretary, Mr. J. R. Bruce. Full credit should be given especially to Miss Seibert for the very efficient way in which the actual detail secretarial work has been handled.

Six state associations have executive secretaries, who devote their entire time to the affairs of the Associations and their journals. Four of these, however, have a much larger

membership than that of the Minnesota State Medical Association. While there are certain advantages in this method of handling state association affairs, I feel sure that the expense of such an arrangement would be much greater than our present arrangement and not more efficient as regards routine detail work. The full time executive secretary plan would entail a considerable increase in cost of operation and this would have to be met through increased advertising or subscription revenue from the journal to avoid increasing Association dues. I, therefore, strongly recommend that the present arrangement be continued, which provides for a general secretary and an executive secretary.

The demands of my private work and the editorship of the journal make it imperative that I retire as secretary and I, therefore, respectfully offer my resignation, effective at the close of the present calendar year. I wish to express my appreciation of the co-operation which I have received throughout the four years that I have been secretary, on the part of the members of the Association. It is a great satisfaction to be able to state that during the four years which I have served as secretary, the Association membership has increased from about 1,500 to nearly 2,000. This shows a very healthy growth and promises well for the future.

Respectfully submitted,

CARL B. DRAKE,
General Secretary.

(On motion, duly seconded and carried, the Secretary's Report was accepted.)

DR. GEO. D. HEAD: If a motion is in order before we proceed with the next business, it seems to me that it is only the fine thing for us to do to express our appreciation of the services of our Secretary during these last four years. I should like to make a motion that by a rising vote the house show its appreciation of the services of Dr. Drake during the time of his incumbency.

(Rising vote and hearty applause.)

THE CHAIRMAN: Dr. Armstrong, the Report of the Editing and Publishing Committee.

REPORT OF EDITING AND PUBLISHING COMMITTEE

REPORT ON MINNESOTA MEDICINE

Our journal, MINNESOTA MEDICINE, is a publication of which every member of this society may well feel proud. An exceptionally high editorial standard has been maintained for the journal since its inception nearly eight years ago, and it is now generally recognized as one of the best medical journals published. The success which MINNESOTA MEDICINE has had in making a place for itself in medical literature is a source of satisfaction and pride to the Editing and Publishing Committee. The advertising pages have been kept clean and thoroughly in line with the policy of the American Medical Association in this respect. While it must be admitted that this policy affects the volume of advertising, it has been an important factor in maintaining a high standard for the journal.

Since MINNESOTA MEDICINE is your journal, it perhaps will not be out of place at this time to ask that each member of our society evidence a personal interest in it. The personal items department should be enlarged, but this can only be done through the co-operation of the members in sending to the editor items which they think will prove of interest. Members are also urged to give preference to MINNESOTA MEDICINE in replying to advertisements, all things being equal, whenever they are in the market for any of the articles advertised in it. If every member would find it possible to mention MINNESOTA MEDICINE to an advertiser at least once a year, it is believed that this would result in a large increase in advertising revenue. It would show our advertisers, all carefully selected and reliable firms, that our members read the journal and that they are interested in its continued success.

The net surplus for the year is lower than we have reported for several preceding years. One of the causes for this is the increased printing cost and another is a slight increase in fixed charges. The main reason, however, may be charged to the general business depression which has prevailed throughout the country for the past three years and particularly in our own section of the Northwest. With conditions improved, as we have every reason to expect at this time that they will be, an increase in advertising revenue is confidently expected.

Some effort has been made during the year to obtain subscriptions outside the state of Minnesota and we now have, roughly speaking, more than 200 paid subscribers to the journal outside our own state.

About 2,600 copies of MINNESOTA MEDICINE are required each month to cover our mailing list. This includes the society membership, the paid subscriptions of non-members, exchanges, institutions, and other complimentary copies.

J. M. ARMSTRONG, Secretary,
Editing and Publishing Committee.

STATEMENT OF OPERATIONS OF MINNESOTA MEDICINE OCTOBER 10, 1923, TO OCTOBER 4, 1924

REVENUE:

Advertising	\$7,628.10
Subscriptions—Non-Members	342.10
Membership Subscription Allowance— 1,952 Members at \$2.00 each.....	3,904.00

Total\$11,874.20

EXPENSES:

Printing	\$4,970.31
Paper Stock	1,851.23
Editorial	1,695.14
Advertising Commission (Bruce Pub. Co.)	1,524.84
Postage	160.00
Envelopes	143.15
Stenographic Service	660.00
Subscription Solicitation	99.85
Sundries	167.14
	11,271.66

Net Gain for the Period October 10, 1923, to
October 4, 1924\$ 602.54

J. M. ARMSTRONG, Secretary,
Editing and Publishing Committee.

(On motion the report was accepted.)

The Secretary read the following report from the attorneys:

REPORT OF THE ATTORNEYS ANNUAL REPORT

October 4th, 1924.

Dr. Carl B. Drake, Secretary,
Minnesota State Medical Association,
Saint Paul, Minnesota.

Dear Doctor:

You have requested it, and we make report to the Association covering the work done by us during the year last past.

Hanson, as Administrator, vs. Schlutz, et al. This action was brought against Dr. F. W. Schlutz and Dr. F. H. Poppe, and the Asbury Hospital to recover damages on account of the death of Lillian Hanson, a child, following an operation for pleural empyema. The case has been dismissed on the merits.

Flynn vs. O'Hara. The charge of malpractice in this case is in producing lacerations with resulting infection in the treatment of Manda Flynn in childbirth. There was a verdict in favor of Manda Flynn in the sum of \$1,600, which verdict, however, on motion for a new trial, was set aside. The action is still pending in Waseca County.

Backlund vs. Frank E. Burch and Charles E. Connor. The alleged malpractice in this case is in severing the tri-facial nerve or its branches, resulting in facial paralysis in

mastoiditis. Backlund has never brought his action on for trial and the case is abandoned.

Godtland vs. Stewart. The alleged malpractice in this case is in advising and permitting the administration of chloroform in the extracting of teeth, the condition of the patient being such that only nitrous acid could be administered, resulting in the death of the patient. Two cases were brought, one covering the death case and the other the loss to the husband, and expenses. The actions have been dismissed.

Martinson vs. Egil Boeckmann et al. The claimed malpractice consists in leaving within the lung cavity gauze and a safety pin, and in failing to remove it, all resulting in the death of the patient. Action has been dismissed as to Dr. Boeckmann but is pending as to the Saint Paul Hospital.

De Berardini vs. Vercellini and Geist. The claimed malpractice consists in improperly performing an abortion, resulting in profuse hemorrhages and general debility. Dr. Vercellini was the family physician and recommended an operation after consultation with Dr. Rothrock. The action has been dismissed.

Korman vs. Hagen. The malpractice claimed in this case is in the premature delivery in childbirth, resulting in a fracture of the femur and Erb's paralysis. There was an adverse verdict in the sum of \$8,000, which is pending on review in the Supreme Court.

Elofson vs. Adkins. The claimed malpractice consists in the improper application of a cast on the leg and in not removing it, causing infection and gangrene, requiring amputation of the leg. The action has been dismissed.

Walrath vs. Hammermeister. The alleged malpractice in this case is in injecting ether into the leg of the patient, thereby causing injury to the sciatic nerve, leaving the patient in a crippled and paralyzed condition. The patient was suffering from pains in the leg. There is also a companion suit brought by the husband. The actions are still pending.

Johnson vs. Shipley. (2 cases.) The malpractice is in introducing into the eye, eyeball and membranes, an acid or foreign substance which severely burned the eyeball and membranes and impaired the sight. Dr. Shipley intended to wash the eye, but in doing so, by mistake used a caustic instead. The case was treated as a liability case, authority was obtained to make settlement, and the cases were settled in the sum of \$750, paid by Dr. Shipley.

Johnson vs. Urstad. The claimed malpractice is the failure of Dr. Urstad to perform an operation to relieve against pleural empyema. The action has been dismissed.

Marka vs. Mankato Clinic. The claimed malpractice is in treating the patient for sciatic rheumatism and in failing to diagnose that the patient suffered from osteomyelitis or arthritis of the left hip joint, resulting in dislocation, shortening and ankylosis. Some of the members of the Mankato Clinic were insured in the Fidelity & Casualty Company and in the Fort Wayne Medical Protective Company, which companies participated in the settlement. Five thousand dollars was paid.

Costenoble vs. Tanner. The claimed malpractice consists in failing to diagnose diphtheria, from which the patient died. The action has been dismissed.

Anderson vs. Ulrich. The claimed malpractice in this case is that the plaintiff did not have surgical resistance; that she was sensitive to poison and in applying Protein sensitization tests, improper dosages were used, resulting in twenty-nine ulcers. The improper dosages, if any, were administered by the interne at the Minneapolis General Hospital. The action is for trial on October 14th.

Singer vs. Bossingham. The alleged malpractice is in failing to remove the afterbirth and in introducing a septic condition, which resulted in focal infection with a crippled condition of the arm. The action was once tried, with a verdict in favor of the defendant. A new trial was ordered by the court for errors in the trial, but the action has now been dismissed.

Ritter vs. Barber. In this case, it is claimed that Dr.

Barber failed to administer antitetanus serum in a cart-ridge explosion on July 4th. The case was dismissed on the merits.

Pickar vs. Pierce. The claimed malpractice in this case was in the negligent failure to perform a Cesarean operation and in failing to make a delivery in childbirth, resulting in the death of the mother. The case was dismissed on the merits. Plaintiff appealed to the Supreme Court, but later abandoned the appeal.

In addition to the foregoing, a number of legal opinions have been rendered to the Association bearing upon various questions. A number of claims of malpractice are pending, but no actions are brought thereon.

Very truly yours,

OPPENHEIMER, PETERSON,
DICKSON & HODGSON,
By Geo. W. Peterson.

(On motion, duly seconded and carried, the report was accepted.)

THE CHAIRMAN: I will call upon Dr. Rothrock for the reading of the Report of the Delegates to the meeting of the American Medical Association.

REPORT OF A. M. A. DELEGATES REPORT OF THE PROCEEDINGS OF THE HOUSE OF DELEGATES OF THE AMERICAN MEDICAL ASSOCIATION AT ITS MEETING HELD IN CHICAGO, JUNE 9-13, 1924

The first meeting of the House of Delegates was called to order by the Speaker, Dr. F. C. Warnshuis, at 10 A. M., June 9, 1924, in the Assembly room of the building of the American Medical Association in Chicago.

After hearing the customary addresses of the Speaker and the President-elect, Dr. William A. Pusey, the House proceeded to hear the reports of officers and Committees.

Report of the Secretary showed that there are now enrolled 90,056 members of the Association, 54,063 of whom are Fellows. It is possible for all members to become Fellows on application.

There are fifty-four constituent State and Territorial Associations, six of which have full time Secretaries.

The House of Delegates for the first time met in the Assembly room of the new A. M. A. building, which now houses all the various activities of the Association.

The subscription to the Journal has now reached 80,958, and from its size and contents has now reached a leading position among medical publications. The new popular magazine, "Hygeia," has reached a total circulation of 23,687 and in Chicago the contents have been used for radio broadcasting with the announcement that the material comes from Hygeia, through the American Medical Association.

From Report of Judicial Council: Periodic Health Examination by Lay Organizations.

Following the commitment of the Association at its San Francisco Session to the principle of encouraging periodic medical examinations for those who apply and even preceding this it has come to the notice of the Judicial Council that numerous commercial organizations have been formed who employ recent graduates or hard pressed practitioners to make these examinations at very low per capita rates, ranging from \$2.00 to \$5.00, and then sell this service to the individual for prices ranging from \$10.00 to \$25.00.

It was disclosed that some members of the Association, some even high in its councils, had unthinkingly lent their names as references, not understanding the use that was to be made of them. It was disclosed that some of these Companies are stock companies, one of which was reported to have an authorized capital stock of \$400,000 and one Company claimed to have 8,000 doctors listed as examiners.

It is the judgment of the Judicial Council that if such examinations are to be made they should be made independently by the physician, the examination should be thorough and should be charged for accordingly at customary rates.

ABSTRACT OF THE COUNCIL'S REPORT

MEDICAL EDUCATION

1. Although the total number of medical schools has been reduced from 160 to 80, the number of high grade, better equipped colleges has been increased from 2 to 74.

2. The total number of medical students was reduced from 28,142 in 1904 to 12,930 in 1919, but since 1919 the enrollments have been increased by nearly 1,000 students each year, the total number of students at present enrolled being approximately 17,808—the largest number since 1912.

3. The number of graduates of medical schools, likewise, was reduced from 5,747 in 1904 to 2,670 in 1918, but since 1918 there has been a rapid increase interrupted only by the war class which graduated in 1922. An estimate indicates that in 1927 there will be 4,750 graduates, the largest number since 1908.

4. The higher entrance requirements and the other improvements made in medical education, therefore, are not causing a dearth in the numbers of either medical students or graduates. As a result of the changes, however, there has been a positive increase in the number of graduates who are better qualified, both educationally and professionally, from 267 or 5 per cent of all graduates in 1906 to 2,964 or 95 per cent of all graduates in 1923.

5. Although the number of medical schools is only one-half of what it was in 1904, the capacity has been greatly increased. Instead of only 156 students and only 36 graduates for each college on the average in 1904, now each college on the average has 223 students and in 1927 will turn out about 60 graduates.

PHYSICIANS TO POPULATION

6. The United States now has one physician for every 724 people as compared with one to 1,087 people in the British Islands and one to about 2,000 people in the countries of Central Europe.

7. Although the number of physicians in rural districts is smaller, this does not mean in all instances a decreased medical service, since the better means of rapid transit enable one physician to take care of a larger area than heretofore. The scarcity of physicians in rural communities is more than offset by a great oversupply in the cities.

RESOLUTION ON THE NATIONAL PROHIBITION ACT

This question comes before the House of Delegates each year but we have been able to accomplish nothing in the past.

According to present ruling a physician is permitted by law to prescribe only one pint of whiskey at intervals of ten days for the same patient. This ruling was the result of abuse of their privilege by certain unscrupulous members of the profession. Now it is contended that one pint in ten days is an infringement upon the rights of the physician in attempting to dictate the amount and dosage of a useful drug. The following resolution was passed:

Resolved: That the House of Delegates of the American Medical Association expresses its disapproval of those portions of the National Prohibition Acts which interfere with the proper relation between the physician and his patient in prescribing alcohol medicinally; be it further

Resolved: That the House of Delegates of the American Medical Association instruct the Board of Trustees to use its best endeavor to have repealed such sections of the National Prohibition Acts as are in conflict with the above resolution and also use their best endeavor to have the Commissioner of Internal Revenue and the Prohibition Commissioner issue revised instruction on the use of the prescribing of alcoholic liquors for medicinal purposes by physicians.

The election of officers resulted as follows:

President—Dr. William D. Haggard, Tennessee.

Vice President—Dr. E. B. McDaniel, Oregon.

Secretary—Dr. Olin B. West, Chicago.

Treasurer—Dr. Austin A. Hayden, Chicago.

Speaker of House of Delegates—Dr. F. C. Warnshuis, Michigan.

Vice Speaker of House of Delegates—Dr. Rock Slyster, Wisconsin.

Vacancies on Board of Trustees were filled as follows:

Dr. J. H. Walsh was elected to succeed Dr. Frank Billings.

Dr. E. B. Heckel was elected to succeed Dr. Wendell Phillips.

Dr. Thomas McDavitt was elected to succeed himself.

Dr. George H. Simmons, who for the past 25 years has been Editor of the Journal and General Manager, and under whose supervision the Association has reached its high state of organization and has been brought to its present point of efficiency, has tendered his resignation and it was voted that he be made Editor and General Manager Emeritus at a salary of \$5,000 a year.

When Dr. Simmons retires Dr. Olin B. West will become Acting General Manager and Dr. Morris Fishbein, Acting Editor of the Journal, and Will C. Braun, Acting Business Manager. All to serve until the next annual meeting of the Board of Trustees the first Friday of February, 1925.

This being the year for reapportionment, the representation of the various states in the House of Delegates will in the future be on the basis of one delegate for every 950 members or fraction.

According to the reapportionment Minnesota thereby gains an additional delegate and will be represented in the future by three instead of two delegates.

Atlantic City was chosen as the next place of meeting, subject to the action of the Board of Trustees.

J. C. LITZENBERG,
J. L. ROTHROCK.

(Motion to accept the report duly seconded and carried.)

THE CHAIRMAN: Report of Committee on Public Policy and Legislation, Dr. Christison.

REPORT OF COMMITTEE ON PUBLIC POLICY AND LEGISLATION

September 10, 1924.

To the President and Members of the House of Delegates of the Minnesota State Medical Association.

Gentlemen:

Owing to the fact that the Legislature of the State of Minnesota was not in session during 1924 the activities of your Committee on Public Policy and Legislation have been necessarily limited. We have co-operated with your Committee on Public Health and heartily endorse the recommendations made in their report.

During the sessions of the Legislature of the State of New York we received almost daily bulletins covering the activities of the Committee on Legislation of the Medical Society of the State of New York.

It would seem from these reports that this Society maintains an office at Albany and has a full time man covering the legislature during the entire session. Whether this is feasible in Minnesota or not your Committee does not know but the subject is worthy of consideration. Telegrams were sent to Governor Smith and Senate Majority Leader James M. Walker at Albany, at the request of Dr. James M. Vanderveer, the Chairman of the Legislative Committee of the New York Society, in the name of this Association, urging the passage of bills relating to the practice of the cults.

A request was received from Dr. W. C. Woodward, Executive Secretary of the Bureau of Legal Medicine and Legislation, of the American Medical Association, requesting a transcript of the evidence in a suit brought to test the constitutionality of the Chiropractic law in Minnesota. Interviews with Judge H. D. Dickinson, of Minneapolis, before whom the case was heard, and with Attorney General Hilton, disclosed the fact that there was nothing of value in the evidence and Dr. Woodward was so informed.

At Dr. Woodward's suggestion letters were sent to the Senators from Minnesota and to each of the members of the finance committee of the Senate, urging modification of the Harrison Narcotic Act, Reduction of the Tax Rate on

Earned Income, and favoring the deduction of physicians' expenses incurred in post-graduate study and in attendance at medical meetings, in the computation of Income Tax.

Letters have been mailed to the chairmen of the Legislative Committees of all County Societies, or to the Presidents or Secretaries of these component Societies, urging them to get in touch with the various aspirants for legislative honors and urge upon them the advisability of informing themselves on medical legislation and to point out to them before they are elected, the necessity for proper regulation of the practice of medicine and surgery.

It is recommended—first, that if possible a full time man be employed during the legislative session, and second, that if any definite legislation is desired by this Association it be formulated at this session and put before the prospective candidates.

J. T. CHRISTISON,
J. G. CHASE,
CHAS. B. WRIGHT,

Committee on Public Policy and Legislation.

DR. J. T. CHRISTISON: Since that report was written we have received a communication from Dr. W. C. Woodward, the executive secretary of the Bureau of Legal Medicine of the A. M. A., asking us to endorse several items. First of all,—I am not going to read all of this, just simply the headings—the regulation of the sale of lye and other caustic substances. Second, the amendment to the National Prohibition Act, removing present legislation which, it is pointed out, interferes with the relations of physician to patient. Third, the Harrison narcotic tax. Fourth, regarding cosmetics, hair dyes, etc. Fifth, regarding the organization of federal health activity. Sixth, exemption of traveling expenses to and from medical meetings from inclusion in the income tax. We also have here a copy of the resolution which Dr. Rothrock read to you. Dr. Woodward asks in his letter that this society go on record as favoring the passage of these bills.

(A motion was duly seconded and carried that the report be accepted, adopted and published at the earliest possible convenience.)

THE CHAIRMAN: Dr. Baker, the Report of the Committee on Sectional Work.

REPORT OF COMMITTEE ON SECTIONAL WORK

For some years our State Medical Meetings have had two sections—Medical and Surgical. Your committee, after careful consideration of the advisability of changing this plan, has come to the following conclusion:

While we do not deny the importance of any special field of medicine, there is no general demand and we do not feel that any subject merits a special section. Instead of creating more sections, we wish to bring to your earnest consideration the advisability of returning to our old custom of having one general meeting. It is well for the surgeon to listen to the medical man, the general practitioner to the specialist and vice versa.

We believe that a State Association should not be a place for specialization. For those seeking this, there are other and better avenues. We believe that our state meetings should consider the common good of all the people as well as all the practitioners of this state and that we should consider these problems together.

We believe that a properly functioning program committee will see to it that each subdivision of medicine will receive the attention which it deserves. If we do this each may know, hear and partake in all that transpires and he will return home with a more charitable and sympathetic view of his brother practitioners and with a broader understanding of the problems of the medical profession.

Our numbers are not too large for successfully carrying

out this plan for they are rarely as large as most of the sectional meetings of the A. M. A.

An example of a great success, in a one section meeting, is the Tri-State Medical Association. This holds yearly a four-day session covering the entire field of medicine and surgery. The attendance at these meetings has been as high as fifteen hundred.

A. C. BAKER,
W. F. BRAASCH,
V. C. HUNT.

A MEMBER: I move we accept the report.

DR. W. A. JONES: I wonder if the time is not approaching when most state associations will do a little better than they have done before in mixing clinics with their papers. It seems to me that the Tri-State Society Dr. Baker has referred to has accomplished wonders in this direction, and I believe that we could make our state association a much more valuable aid if we incorporated as we did at Duluth a few papers and many clinics. I believe the men would get more out of it and it would be a much more interesting and satisfactory meeting. I wish this matter might be taken up for consideration.

DR. GEO. D. HEAD: It strikes me that possibly before taking rather hasty action upon this recommendation of the Committee without due consideration it might be well for us to know exactly the situation from the preceding chairmen of the sections as we are at present organized. It has always seemed to me that we ought to encourage as much as possible the presentation of the work of the various members of our association at our state meeting, and especially to encourage young men in any research or clinical work that they may wish to present. Now if we adopt the one session idea and go back to our old plan, I for one feel that it has many strong points, this meeting together in one general session. Nevertheless, with our large association and our growing membership, isn't it going to cut off the opportunity for many of the younger men in the profession to be encouraged to come in here and present their work? I would not like, for one, to vote for a method of organizing our program which would have a depressing effect upon the younger man in the profession. It seems to me that it is very important for us to know whether or not the chairman of the surgical section has had more papers offered on his program this year than he could well accommodate in the program, and the same of the medical section.

I would like to make an amendment to Dr. Jones' motion therefore, that the Chair appoint a special committee to take up the report of the Committee on Sectional Work and report at the last meeting of the House of Delegates. Perhaps Dr. Jones would be willing that that amendment should be accepted; that a special committee be appointed by the Chairman to investigate this side of the matter before we finally vote.

DR. W. F. BRAASCH: Before voting further on the question, Mr. Chairman, may I simply say that it is the intention of this Committee not to shorten the number of papers and to abbreviate the program at all. It is scarcely within our province to detail the programs, that is, to set the program to the extent that we had planned. However, we wanted to incorporate the idea of Dr. Jones. Now in adopting this method instead of shortening the program we would lengthen it. In other words, the point of our idea

was to have clinical presentations, case reports, slides and illustrations, pathological demonstrations, things of that type, limited possibly to eight or ten minutes, much the same as they do in the Tri-State Assembly. Now you take for instance a one-day program of the Tri-State Assembly embodies a good deal more than our entire program does in the two sections this year. Instead of curtailing the opportunity it would increase the opportunity for the presentation of the subject by adopting that method. We did not think it was our province to go into that in detail, but that was our intention.

(The motion to accept the report, without adoption, was duly carried.)

DR. V. C. HUNT: I think in answer to the question that Dr. Head raised, the atmosphere can be cleared in just a few moments. Regarding the difficulties concerning getting papers, Dr. Tuohy I am sure in a very few minutes can give his report of the work in getting the Medical Section rounded up.

DR. E. L. TUOHY: I had no difficulty in getting papers for the Medical Section, and I think the Surgical Section had the same experience. Many papers were offered. The question may be answered directly as outlined by Dr. Braasch, but another feature involved has to do with the ultimate welfare and standing of our state journal. If too many of the papers or discussions are in the form of clinics, a valuable source of material for the publication of the journal is lost, and while a considerable number of papers may always be available for publication, it is just possible that they might not represent the state as a whole as well as if it were possible to draw some of this material from these meetings. I would feel, therefore, that it would be advantageous to study the matter out closely. The giving of a program, however, in which clinical demonstrations bear a part must certainly be a work of the future, because it has been shown repeatedly already that that type of meeting will draw more attention and better results than papers alone.

DR. W. A. JONES: I make the motion that a change in the by-laws be made providing for the return to the one section, to be voted on at the meeting tomorrow according to the constitution. I also request that the officers or the Executive Committee order the by-laws so that they may conform to the different sort of meeting. I would like to say that it has been my experience, and I think Dr. Tuohy will agree, that the clinical reports are much better and much more frequently read than these massy papers, and I think it would increase the popularity of the journal rather than to decrease it.

THE CHAIRMAN: I would like to know what Dr. Drake thinks about that. Do you think that the clinical meetings bring out the material in such form as to be available for publication?

THE SECRETARY: I do not know that I can answer that question inasmuch as in MINNESOTA MEDICINE we have published very few case reports. The reports of the proceedings of the Minnesota Academy and the Minneapolis Surgical Society are about the only case reports that we publish. We haven't had more than perhaps half a dozen additional case reports in the last year. I think probably the members of the House of Delegates know pretty well

what they read. I feel this way about it, that we get a good many case reports in the meetings of the hospitals nowadays. I do not think there is any more valuable way of getting information than by reading such reports. The formal paper is a very valuable part of a state medical publication, but I think that possibly the papers that are presented could be given in an abstract form at the meetings, and we could get in therefore a greater number of papers. If we have a combined section as proposed, we will have to cut the presentation time down in order to get the same number of papers in that we have in the two sections now.

If this matter is allowed to go in the form of a motion that a special committee present it tomorrow, we will have to wait a year. If it is the wish of the House of Delegates to have a common meeting throughout the convention next year, the motion should embody that at this time; that is, have the proposition before the House at this time to be acted on tomorrow. Dr. Jones' motion ought to embody that, and I do not think it did. Will you ask Dr. Jones to repeat?

DR. W. A. JONES: I would like to move that Dr. Baker's recommendation for the single meeting be adopted at the next meeting of the House of Delegates, and that the Program Committee be instructed to put on any kind of program they may see fit, but to embody the clinical material for the presentation to the association as much as possible. I think that is really the substance of the motion that I intended. My intent is to get the association to combine both papers and clinics, hoping that clinics will predominate.

DR. W. A. COVENTRY: May I ask for the reading of the by-laws to cover that subject?

THE SECRETARY: Under Chapter VIII of the By-Laws there is a provision made in Section 1 for (reads) "A Committee on Scientific Work, consisting of two sections." In Section 2: "For medical advancement and scientific work the Association shall be divided into two sections to be designated, 1st, Section on Medicine, 2nd, Section on Surgery, under which shall be grouped the appropriate subdivisions represented by the special branches of Medicine and Surgery respectively." Under Chapter XII—Amendments: "These By-Laws may be amended at any annual session by a majority vote of all the delegates present at that session, after the amendment has lain on the table for one day."

DR. W. A. COVENTRY: May I ask for a point of information? If I understand Dr. Jones, my idea is that you do not amend the by-laws but offer a recommendation for the committee next year. If you are going to amend the by-laws it has to be introduced today and acted on tomorrow. If you are not going to do that, it means that there will be two chairmen and two secretaries for the two sections, and under Dr. Jones' recommendation it will be possible to combine these, that is, the secretaries and the chairmen of the two sections get together and arrange a program as they wish. If you have only two sections for one part of the day, that is enough to cover the point without necessarily amending the by-laws. If you amend the by-laws you may want to re-amend them again next year, and you will get a lot of confusion before you get through with it.

DR. J. L. ROTHROCK: Inasmuch as I was the one who started the establishment of this sectional arrangement, I

would like to state to the delegates the reason why that was done. It was found that previous to that we sometimes met in the smaller towns where there was not an adequate hall to accommodate all those who wished to attend the sessions. The places of the meetings were small. It was also believed that we might be doing just twice the amount of work by having two sections. An arrangement at that time was made and intended that a certain number of these sessions should be together, that is, combined sections, and a portion of the time spent in that way. At those times symposiums on various subjects would be discussed. In the larger cities of course there are usually halls adequate for housing all of the association, but sometimes the halls that we were meeting in were crowded and it seemed to a number of us who thought of this plan that it would be a good plan and that we might just double the amount of work we were doing. We seemed to be doing a very creditable amount of work for a large association like a state association. That was why this change was made. Previously, I might say, the getting up of the program was left to the secretary of the association, and we thought that we would get better programs if we had a chairman for them, and the chairman and secretary get up the program.

I cannot see now why it would not be a good idea to continue on this plan but make some arrangement for combined sessions. That will cover the demand which seems to be present today. As far as Dr. Braasch's statement is concerned, that one session could cover the same amount of ground as both, I can't quite see how that is possible in a limited time. Unless the days of the meeting were extended, I can't see how it would work out.

DR. GEO. D. HEAD: The reason why I made the amendment to Dr. Jones' motion which I did was because it seemed to me that this was a radical change from the method that we have been following for some years, and it struck me that by making a little bit of a change in the method by which the chairmen of the different sections presented their material we could accomplish with our two section arrangement almost all that we could by having a one section program, and besides we could obviate some difficulty. Now there is no question at all but what in this state gradually but surely we are developing men who are interested in and practice the medical side and men who practice and develop to a greater degree year after year the surgical side. While it is of course advantageous for those men to get together in common conference over certain classes of disease, those conferences can all be well arranged by having a combined program such as we have tomorrow in our general session. That can be enlarged and more programs of the two sections put together if necessary. I do not believe it is conducive to the best work in medicine for men interested more in the medical side of practice, medical, diagnostic, and consulting work, to be compelled to listen to programs in which the surgical considerations predominate, and vice versa.

Now can't we proceed with our same arrangement of two sections and still provide all that Dr. Braasch has suggested? Could not this year a common program where the two sections meet together be devoted entirely to the clinical presentation of cases, instead of having it that each section

have presented such papers as are of interest either to the surgical or the medical section. Let those papers be presented to men interested; then let us all come together in these common sessions and have those clinical sessions and have no papers at all but have many short presentations, a very well boiled down, concentrated program upon the clinical side of medicine, presenting practical cases. It seems to me that it would be very radical for us to change our plan of working without more due consideration.

I therefore wish to make an amendment to Dr. Jones' motion, that the recommendation of the Committee be referred back again to this same Committee, the Committee on Sectional Work, for another year's consideration.

DR. W. H. WORKMAN: I do not see any reason for discussing this thing at all. It is already provided for in the by-laws. Article VIII—Sessions and Meetings, Section 1 provides (reads): "The Association shall hold an Annual Session, during which there shall be held daily General Meetings, which shall be open to all registered members and guests." We do not have to change our constitution or by-laws or anything else; we can have the clinical meetings under our present regulations. We already have one general session in an afternoon; that can be made a whole day. I do not see anything to change at all.

DR. W. F. BRAASCH: I disagree with Dr. Head in the statement that this is a radical change. I wonder if he has ever attended a meeting of the Tri-State Assembly and if he has seen the enthusiasm and the general approbation with which those programs are received. Everybody enjoys them; everybody can get what he wishes. Dr. Baker says in his report that it does a surgical man good to hear a discussion on medical subjects and it does a medical man good to hear a discussion on surgical subjects; in other words, most of us here are general practitioners, and I think it would do them good to hear both sides. It appears to me that this method is very elastic and offers large opportunities in the form that is to be pursued. This method is not radical either, because it has been adopted by several state associations.

DR. GEO. D. HEAD: I didn't mean it was radical—I knew that programs have been arranged along this line; but I meant it was a radical change for our own association.

DR. J. G. CROSS: Is Dr. Head's amendment seconded?

THE CHAIRMAN: I think not.

DR. J. G. CROSS: I would like to second his amendment, and in doing so may I ask that the report as read by Dr. Baker be reread as far as it relates to the desired single sections?

(At the request of Dr. Drake, Dr. Baker read the following:)

DR. A. C. BAKER: "While we do not deny the importance of any special field of medicine, nevertheless there is no general demand and we do not feel that any subject merits a special section. Instead of creating more sections, we wish to bring to your earnest consideration the advisability of returning to our old custom of having one general meeting. It is well for the surgeon to listen to the medical man, the general practitioner to the specialist and vice versa."

DR. J. G. CROSS: You simply bring to the attention of the society the desirability of these single meetings.

DR. COVENTRY: Question.

THE CHAIRMAN: You have heard the motion as made by Dr. Jones and I think seconded by Dr. Braasch with reference to presenting this matter to the House of Delegates tomorrow. As many of you as are in favor signify by saying aye. Contrary, no. Carried.

And the amendment of Dr. Head, that the matter be referred back and reported on one year from now. Is that the amendment, Dr. Head?

DR. GEO. D. HEAD: To the same committee for one year.

DR. W. A. JONES: I cannot refrain from talking about this more. It seems to me that this is unnecessary to wait a year to try out some wholesome experiment. We can put a medical and clinical section over at one session just as well as not, if we will do it. I should like to introduce another resolution while I get a chance, authorizing and directing the Program Committee to follow this out. I hope Dr. Head's amendment will not prevail.

DR. J. C. LITZENBERG: I rise to a point of order. The original motion has been acted upon, and that disposes of all amendments.

DR. J. W. BELL: I think the Chair perhaps erred slightly. The amendment should have been considered first, and I think it might be well for us to go back and take it up.

THE CHAIRMAN: I stand corrected.

DR. J. C. LITZENBERG: I rise again to a point of order. The motion to reconsider must be passed before we can go any further.

DR. GEO. EARL: Can we not secure what we are all striving to get by having Dr. Head now make a motion that the Chair appoint a committee to report to us on Dr. Jones' motion tomorrow? That will serve the purpose and we will vote on this question tomorrow, and we will also have the advantage of Dr. Head's committee.

DR. G. S. WATTAM: I would like to ask this question: Could not Dr. Jones' motion be amended tomorrow if it is felt necessary?

THE CHAIRMAN: I understand that tomorrow it has to be settled. I am going to ask Dr. Head if he will make a motion to get me out of hot water.

DR. GEO. D. HEAD: I will be very glad to do that. I move you that the Chair be authorized to appoint a special committee to make a special report upon this matter at our session tomorrow.

(Motion seconded and carried).

THE CHAIRMAN: I will appoint on that committee Dr. Braasch, Dr. Head and Dr. Jones.

The Report of the Committee on Cancer, Dr. Hunt.

REPORT OF COMMITTEE ON CANCER

To the President and House of Delegates of the Minnesota State Medical Society: Your Cancer Committee begs to submit the report of its activities during the past year.

A review of the discussion precipitated by the report of this Committee at the meeting of the House of Delegates on the first day of the State Society meeting in 1923 presents an interest in the subject of cancer control manifested for the first time. This discussion in itself has served as a stimulus to all members of the Committee to continue in behalf of the State Medical Society the conduct of the educational work as outlined and directed by the American Society for the Control of Cancer.

The constructive criticism offered after the presentation

of the 1923 report has resulted in the coalition of the Cancer Committee of the State Medical Society and the State Cancer Committee of the American Society for the Control of Cancer, which enables the Committee to carry on the activities of cancer control under the direction of the State Medical Society. As a result, the activities of this Committee have been conducted in the past year with increasing harmony in the membership of the State Medical Society. As stated in previous reports, it has been the opinion of the State Cancer Committee that it could best serve the interests of the State Medical Society by co-operating with the American Society for the Control of Cancer in its educational campaigns.

The campaign, as outlined in previous years, was again conducted in Minnesota throughout the week of November 11th to 18th in 1923. During that week statewide publicity was given the most salient facts about cancer, through the organization and activities of seventy-six County Cancer Committees. Through these organizations short talks were given, and literature, furnished by the National Society, was read before many audiences, including churches, fraternal organizations, clubs, et cetera. Thirty-one public meetings were held under the auspices of County and District Medical Societies. The newspapers throughout the state contributed liberally of space for articles dealing with the known facts about cancer, furnished by the National Society. Other activities consisted of five cancer clinics, two radio talks, the showing of the film, "The Reward of Courage," and slides in many theatres, et cetera.

Your Committee believes that educational work should continue and desires the co-operation of the individual members of the State Medical Society. Also, the Committee wishes to follow the suggestion of the House of Delegates in the conduct of its work.

We desire at this time to express our thanks and appreciation to the members of the State Medical Society who have been active in the educational campaigns, particularly those who have acted as County Chairmen, and those who have contributed their time and money in the presentation of public lectures.

Respectfully submitted,

VERNE C. HUNT, Chairman,
A. C. STRACHAUER,
AARON F. SCHMITT,
HENRY WIREMAN COOK,
HARRY P. RITCHIE,
A. J. CHESLEY.

(Motion to accept the report duly seconded and carried.)

Dr. C. B. Lewis called attention to the entertainment planned for the ladies for Thursday: Tour of the State Reformatory, luncheon and band concert there, and visit to Watab Pulp and Paper Company's plant.

THE CHAIRMAN: Report of the Necrologists, Dr. McDavitt.

REPORT OF NECROLOGIST

We are again called on to chronicle the names of those who have laid down their burdens and gone to that bourne from whence there is no recall. All of these honored names have performed their allotted tasks with honor and credit to themselves and their communities and well deserve the encomium, "Well done good and faithful servant." Those of us who remain can only honor their memory by emulating their virtues. As indicating the uncertainty of this life the necrologist of last year, Dr. J. H. Adair, heads this list of our departed members. It is with high regard and admiration for lives nobly spent that we detail the list of our confreres "who have finished the course" and have gone to their reward.

FORMER PRESIDENTS

NAME	ADDRESS	YEAR	DECEASED
Adair, J. H.	Owatonna	1920	1/ 6/24
Beebe, W. L.	St. Cloud	1891	8/13/24
Courtney, Walter	Brainerd	1900	6/23/24
Sneve, Haldor	San Diego, Cal.	1912	7/.. /24
Dennis, W. A.	St. Paul	11/ 8/23	
Douglass, H. E.	Blackduck	6/14/24	
Egan, John M.	Minneapolis	11/30/23	
Eggen, O. K.	Minneapolis	3/26/24	
Gotham, C. L.	St. Paul	4/28/24	
Haugen, O. M.	Fergus Falls	5/25/24	
Hoffman, J. L.	Henning	2/ 6/24	
Kirmse, Geo. W.	Minneapolis	11/25/23	
Knickerbocker, F. H.	Staples	11/17/23	
Landenberger, John	New Prague	5/13/24	
Lufkin, H. M.	St. Paul	7/ 6/24	
Lund, Theo. C.	Hutchinson	2/25/24	
Ogden, B. H.	St. Paul	6/12/24	
White, J. B.	Belle Plaine	9/ 5/24	
Witherstine, H. H.	Rochester	10/ 2/24	

The deaths of the following are listed in our Medical Journals as having died in the ranks:

Cole, A. B.	Fergus Falls	6/.. /24
Bomberger, F. J.	Mapleton	6/.. /24
Chapman, O. S.	Minneapolis	2/ 5/24
Crommett, H. B.	Amery, Wis.	2/ 6/24
Davis, Geo. W.	Duluth	5/.. /24
Downer, Mary A.	St. Paul	1/.. /24
Dumont, Frank	Freeport	7/.. /24
Foster, Lyman P.	Minneapolis	4/.. /24
Herring, H. H.	Minneapolis	6/.. /24
Higbee, A. E.	Minneapolis	4/ 3/24
Lind, Alfred	Cuba (formerly Mpls.)	6/.. /24
McAuliffe, J. A.	Duluth	3/23/24
McCormick, S. D.		11/17/23
Murdock, H. G.	Taylor's Falls	8/ 8/24
Quinn, J. A.	St. Paul	12/27/23
Seeley, John S.	Faribault	3/ 2/24
Smith, D. Edmund	Minneapolis	12/.. /23
Nelson, J. C.	St. Paul	3/13/24

(On motion the report was accepted.)

THE CHAIRMAN: Next is the Report of the Committee on Hospitals and Medical Education, Dr. J. C. Litzenberg.

REPORT OF COMMITTEE ON HOSPITALS AND MEDICAL EDUCATION

To the President and House of Delegates of the Minnesota State Medical Society:

Gentlemen: Your Committee on Medical Education and Hospitals has the honor of submitting the following report: FIRST—HOSPITALS:

In its work of raising the standards of hospitals the Council on Medical Education and Hospitals of the American Medical Association has adopted the plan of publishing a list of hospitals approved by it for the training of interns.

In addition to an investigation of each hospital by a representative of the Council from the home office at Chicago the Committee on Medical Education and Hospitals of the state in which any hospital applying for approval is located is asked to make an independent investigation and report to the Council. Your Committee was requested to make one such survey during the year, namely, of the New Asbury Hospital of Minneapolis. The survey was made and the hospital recommended for approval by the Council. Seventeen hospitals in Minnesota are now approved for the training of interns.

SECOND—MEDICAL EDUCATION:

The Committee on Medical Education and Hospitals of last year, headed by Dr. Braasch, made a very comprehen-

sive and valuable report on both undergraduate and graduate medical education in Minnesota.

Your present Committee will therefore not go into any detail concerning the present status of medical education in the state, but will first take up the recommendations of Dr. Braasch's Committee to see whether or not the profession of the state has profited by those wise proposals. Too often recommendations of Committees which have spent valuable time and concentrated effort on their work are literally thrown into the waste basket by the hackneyed motion, "I move the report of the Committee be accepted and placed on file." Therefore, your present Committee makes but one recommendation with the hope that the Committee next year will be instructed to concentrate all its efforts on education to be carried to the physician in his own locality.

The recommendation of Dr. Braasch's committee—

"That the University of Minnesota offer several courses of instruction at different periods of the year and possibly in a more concentrated form" has been carried out by the University.

In the spring, for two weeks, courses were offered "in a more concentrated form" in Medicine and Surgery, and in the fall for another two weeks in Pediatrics and Obstetrics and Gynecology, together with a one week's course in x-ray diagnosis, laboratory clinical and pathological diagnostic methods.

Another recommendation of last year's Committee was:

"That a system of graduate medical instruction be given by competent instructors in various portions of the state enabling the general practitioner to become familiar with recent medical progress." This has been taken up by your present Committee which begs leave to make the following report of its investigations with recommendations for putting it into effect: Certain states, notably Wisconsin and North Carolina have undertaken to take instruction to the practitioner. Time and space will not permit a detailed description of this work but the essential features of the plan are these:

Wisconsin. "The purpose of the courses offered in post-graduate medical instruction is to provide physicians, residing in a given locality, with practical demonstrations of the newer methods of diagnosing and treating disease. Clinics are held at a hospital conveniently located, illustrated lectures are given, and opportunity is offered for consultations with specialists. Arrangements may be made for a single clinic and lecture or for a series of weekly, bi-weekly, or monthly clinics and lectures. Arrangements for these clinics and lectures are made through co-operation between the local physicians under whose auspices the clinics and lectures are held and the Dean of the University Extension Division. Physicians enrolling for the course are charged a fee sufficient to cover part of the overhead expenses, the balance is paid from the small appropriation made for this work by the state legislature. The following courses, each consisting of one clinic and one lecture, are offered:

Internal medicine, radiology, pediatrics, dermatology and syphilis, neurology and psychiatry, genito-urinary diseases, orthopedics, laboratory diagnosis; diseases of the eye, ear, nose and throat; obstetrics and gynecology.

The courses are given by teachers from the University of Wisconsin and prominent professional men of the state.

In addition to these courses obstetrical films are exhibited and the cancer propaganda is conducted in harmony with the above courses by a committee of the State Medical Society of Wisconsin, illustrated by 125 slides.

North Carolina. In this state the work is also conducted by the University Extension Division.

Mr. Chester D. Snell, Director of the Extension Work, in a letter to Mr. R. R. Price, Director of the same work at the University of Minnesota, says:

"I should like to make it clear that the work which we are offering is regular post-graduate medical instruction, and is not devoted to clinics alone. Each class meeting last summer lasted about three hours, of which an hour and a half, approximately, was devoted to a lecture by the in-

structor and the rest of the time was taken up by clinical work. Some of the meetings lasted a whole afternoon when the classes got interested in the clinical work.

"We ran two circuits of six towns each last summer, and the total attendance in each circuit was one hundred each, or an average of seventeen in each group or class. This next summer we expect to run at least six circuits, and hope to have practically all the general practitioners in this state taking the work.

"Let me say that as far as we are able to judge, this work has been a tremendous success in this state, and we believe we have found a solution of the problem of how to give busy doctors post-graduate medical instruction without great expense or loss of time to them."

"The plan is briefly this: The University Extension Division, in co-operation with the Dean of the Medical School, serve in an organizing capacity. The best available instructor in the country is secured to give the course. Between ten and twenty physicians are assembled at five or six conveniently located towns accessible to the instructor on one day each week for twelve weeks. Each meeting consists of a one-hour lecture and from one to two hours of clinical work. Each group therefore receives a total of twelve lectures and twelve clinical demonstrations. The cost to each person is guaranteed to be not more than thirty dollars. Should the total receipts exceed the cost, the excess will be refunded pro rata.

"Post-graduate medical education is a necessity because of the rapid advancement in medical science. The average general practitioner cannot afford to be absent from his practice six weeks in order to take a course in residence at a cost of \$400 or \$500. What is now known as the 'North Carolina Plan' was inaugurated in the summer of 1916.

"Two instructors were appointed. Each was assigned to a circuit of six centers, which he covered in rotation every week for four months, a class thus being held in each city once a week. The classes were composed of physicians residing in these centers and their surrounding rural communities.

"The actual organization of the classes, and the planning of the instructors' routes and other executive work was carried out by the University Extension Division, while the more strictly medical problems, notably the selection of the instructors and the outline of the work, were in the hands of the Dean of the Medical School."

The experiment in these two and other states has been very successful. Your Committee believes that the profession of this state will welcome an opportunity to broaden its knowledge and to keep up with medical progress which some such plan will furnish at a minimum expenditure of time and at a reasonable cost.

Therefore your Committee recommends:

1. That the Committee on Medical Education and Hospitals be instructed to confer with Mr. Richard R. Price, Director of the Extension Division, and Dean Lyon, of the Medical School, as to the feasibility of the scheme. (Mr. Price and Dean Lyon have expressed to the Committee their willingness to co-operate with the State Medical Society in every possible way.)

2. If found to be practicable, to adopt a plan suitable to the peculiar conditions in Minnesota, and

3. Subject to the approval of the Council to put the plan into effect in co-operation with the Director of the Extension Division and the Dean of the Medical School of the University of Minnesota.

4. Finally your Committee believes that the plan can be made self-supporting but it realizes that in inaugurating any new scheme there may be some incidental expenses necessary; we therefore recommend that a small appropriation be made to insure success.

Respectfully submitted,

J. C. LITZENBERG, Chairman,
A. R. COLVIN,
E. S. JUDD.

DR. H. P. DREDGE: I move the adoption of the report—I do not say acceptance; I say adoption. And I would like

to ask what appropriation this Committee thinks would be advisable.

DR. J. C. LITZENBERG: Well, I do not know, but the only expense would be office expense, stenographic expense, a little printing, and things of that sort. I do not know what it would cost. Fifty to one hundred dollars probably would be the outside figure. As far as that is concerned, there would be reimbursement afterwards. Mr. Price, of the Extension Division, has expressed his willingness to do the executive work on this, and he is very enthusiastic about having the State Medical Society conduct this work through its own committee rather than to have it conducted simply by the University. He thinks that that is the way to conduct it because then it will be the State Society's own scheme, but he is willing to offer his services. I asked him if there was any available money in his appropriation, and he said no. Therefore we have made this last recommendation. I think a motion not to exceed one hundred dollars would probably cover it.

DR. R. T. EDWARDS: I would move, Mr. Chairman, that this report be adopted and that we make an appropriation of such money as is necessary, not to exceed one hundred dollars, for the work, subject to the approval of the Council.

(Motion duly seconded and carried.)

THE CHAIRMAN: Committee on Public Health, Dr. Savage.

REPORT OF COMMITTEE ON PUBLIC HEALTH

In response to a letter from the chairman of the State-wide Publicity Committee your committee on April 15, 1924, met with Dean Nicholson and the director of the University Public Health Service and the Vice-president of the Hennepin County Medical Society to investigate the Public Health Service of the University of Minnesota.

The following statements were made by representatives of the Public Health Service. About 60 per cent of the University students are putting themselves through college either in whole or in part. Ninety per cent of those who report to the staff would probably not see any physician if it were not for the public health service.

The public health service refers a great many students together with their findings to their family physicians when they live in the Twin Cities, and their policy is to do this in those cases where they feel they are able to pay ordinary fees. They admit that the occasional case able to pay ordinary fees occasionally slips by them, but of what free institution is this not true?

In the judgment of your committee the great work they are doing is that of educating these young people to the value of regular examinations, to the value of reporting themselves early in case of sickness and last but not least the thousands of students are graduated educated to the value of regular medicine rather than being advocates of the cults.

As to the good accomplished among the student body there is no question. This is detailed in the April issue this year of MINNESOTA MEDICINE.

Your committee wishes to go on record as heartily indorsing the University Public Health Service.

For the first time the State Medical Association in conjunction with the University of Minnesota has put on a health exhibit at the State Fair. Dr. Wm. O'Brien, of the Medical Department, has had charge of the work and the medical association has paid the bills. The general scheme was outlined in the September issue of MINNESOTA MEDICINE.

At the 1923 session of the House of Delegates the Committee on Public Health for this year was requested to gather information throughout the United States relative

to the points of contact between the medical profession and the public. Forty-nine questionnaires were sent and thirty-three responded. Including Minnesota we have statistics from thirty-four states.

No. 1. Does legislation initiated by the medical profession meet with a fair degree of co-operation in your state or the reverse?

Excellent 6%, good 14%, fair 40%, poor 40%.

No. 2. Are the medical men of your state organized into legislative committees with reference to proposed legislation?

In nine states special organizations; in 24 states handled by the state committee; in one state no organization.

No. 3. Does your State Association or public health agency publish a journal devoted to medical and public health matters for the laity?

Six states do this including Minnesota and one state has a tuberculosis journal.

No. 4. Does your State Association or any component medical society approve or conduct systematic radio talks?

Kentucky, Ohio, Washington (state), Pennsylvania and Wisconsin do this. Approval of the idea expressed by Georgia, Iowa, Texas, Nevada. Minnesota hopes to begin such a program this fall.

No. 5. Have you a public health league or similar organization which develops contact between the profession and the public?

Fifteen states have, including Minnesota.

No. 6. Have you a state hospital for medical and surgical cases and if not through what channels are the poor in your rural communities cared for?

Twelve, including Minnesota, answer yes. Sixteen provide community care only. Six have an insane hospital or none.

No. 7. Are your hospital facilities for indigent tuberculous cases ample?

Yes 10; fair 10; no 10. No tuberculous cases requiring hospitals 2.

No. 8. Grouping together osteopaths and chiropractors, what is their percentage to medical men?

Unknown, 7. The balance of the states run all the way from 3% to 50% in Wisconsin. In Minnesota the proportion is about 20%.

No. 9. What are your state activities along the lines of child welfare?

Every state that answered is active in this line.

No. 10. Any other information showing points of contact between the medical profession and the public would be greatly appreciated.

Five states have lecture programs. One state offers occasional lectures and one gives state clinics. Kentucky, Georgia and Wisconsin have systematic public press articles.

If we analyze conditions in Minnesota from the standpoint of contact between the medical profession and the laity we find some satisfactory conditions as well as the reverse. Co-operation on the part of the state legislature is very far from what we could desire. Local county society legislative committees were organized two to three years ago and should be continued. The committee on legislation of the state association is helpless without general co-operation throughout the state. These committees should be active in the pre-election period.

We find two lay journals in Minnesota devoted to public health matters—one published by the Minnesota Public Health Association—the Northwestern Health Journal with a subscription list of over 10,000. This journal deserves the support of every physician in the state and should be in every doctor's waiting room. The second journal is the Popular Health Magazine which is privately owned and exists for private gain.

The Minnesota Public Health Association deserves more than passing comment.

In 1903 the Minnesota Anti-Tuberculosis Association was organized. In 1907 they had a paid executive secretary. In 1915 the name was changed to the Minnesota Public

Health Association. It is financed entirely through the sale of Christmas seals and this income this year was over \$100,000.00. Their activities include:

Clinics—tuberculosis, pediatrics and public health.

Tuberculosis clinics are conducted by county sanatoria men.

Pediatric clinics by specialists whose expenses are paid by the association. The public health clinic consists of a doctor and nurse who travel over the state in a Ford truck provided the counties have sold enough Christmas seals to pay expenses.

Four public health nurses were in the field this summer. Health exhibits are loaned as occasion demands. They try to have them at local county fairs as well as at the state fair. They also send a health clown to these fairs.

Dr. Lohead will give health lectures anywhere in the state.

They distribute much public health literature free of charge. They publish at a loss the Northwestern Health Journal with a circulation of over 10,000.

The matter of radio broadcasting in Minnesota on public health matters by the medical profession has been a storm center of discussion. The consensus of opinion is that the name of the speaker shall not be announced unless he is a full-time teacher or public health worker and not engaged in the active practice of medicine. Your committee is convinced that to allow a relatively small number of active practitioners, whose names are announced over the radio, to broadcast public health talks, would create bad feeling and is not good policy. Five states or county societies broadcast public health talks and four states expressed approval of the plan. Your committee warmly endorses the plan if properly safeguarded. The two stations in Minneapolis have discontinued but if either of them reopens, broadcasting will probably be done under the auspices of the Statewide Publicity Committee. There are in our state 128 nurses doing public health work exclusive of the Twin Cities and Duluth. There are forty-six county nurses and thirty-seven counties have no nurse. These nurses are paid by various agencies—the local county commissioners, school boards, Red Cross or Minnesota Public Health Association. Olmsted county has a county health nurse, infant welfare nurse, a county maternity nurse and a school nurse.

Thirty-seven counties of the state support fourteen county tuberculosis sanatoria. This is in addition to Walker.

Minnesota is one of the twelve states out of thirty-four which are equipped to care for the indigent sick both general and tuberculous.

Some interesting features of work along these lines have been worked out in other states. The Ohio Public Health Association is the chief medium of contact between the profession and the laity. In addition they have a public health federation including dentists, druggists, nurses, hospitals, the public health association and physicians.

In Kentucky the county medical societies work in close co-operation with the Bureau of Child Hygiene and the State Board of Health. All local clinics are under supervision of the county medical societies. The State Medical Association and the State Board of Health are closely coordinated. The State Health Officer is the secretary of the State Medical Association, and therefore the state association guides the activities of the State Board of Health, which is the legal aim of the profession and is so recognized by the legislature and the public.

In Colorado the Denver City and County Medical Society conducts monthly public health lectures. They have a Colorado association for the protection of public health composed of many prominent laymen as well as doctors.

Massachusetts. "It is only a few months ago that our society first took up this matter of contact between the profession and the public, and we have spent most of our time investigating the possibilities. So far we are depending upon lectures which we insist shall be constructive, not argumentative, and the block material for the county newspapers. We are making contact through parent-teachers' associations, women's clubs, labor unions and any place

where they may want a lecturer. Each district society is asked to hold an occasional meeting in their district."

In Georgia they have a statewide health association composed of the state chamber of commerce, bankers, railroads and the medical profession. Also a state health council composed of medical associations, Red Cross, the tuberculosis association, Kiwanians, Rotarians, women's clubs, state agricultural society and Physical Education Association.

Texas. The medical profession is raising a considerable sum of money for a publicity campaign in order to gain public and legislative support.

From a study of the answers received one is impressed with the general recognition of the idea of the advisability of our profession developing contact with the public along public health lines. The basic underlying principle is to strive for an intelligent public viewpoint toward the medical profession.

Individual members of your committee have repeatedly had the idea of effort along these lines held up to ridicule by high grade medical men. They say that we are not in a position to do anything as long as we harbor crooks and abortionists and ignorant doctors in our medical societies and allow them to practice medicine.

They say get rid of them first and we can present a clean front to the public and propaganda will not be necessary. Then they add, "How are we going to do it?"

Such types exist in all professions. Your committee believes that the same principle that governs in the acceptance of a life insurance applicant, namely a confidential report on the moral hazard involved, should also govern in the selection of candidates by the medical schools, namely, a confidential report on character. Those who cannot measure up to established standards should be rejected.

However, if we allow the public to rate the entire medical profession by its relatively few crooks we commit a gross injustice to ourselves.

RECOMMENDATIONS

(1) That local committees on legislation be continued in every county society in the state.

(2) That local committees on public health in every county society take an active interest in all local public health matters.

(3) That radio broadcasting on public health matters be undertaken as soon as possible under the auspices of the statewide publicity committee, that such talks be announced as being given under the auspices of the Minnesota State Medical Association and the _____ County Medical Society, but that the name of the speaker shall not be announced if he is engaged in the active practice of medicine.

(4) That the Minnesota Public Health Association be asked to broaden the scope of their work to include the sending of selected articles on public health to the newspapers of the state at regular intervals and to obtain the newspapers' co-operation for their publication.

(5) That the association indorse the Northwestern Health Journal and permit the management to state that it is the official journal for the public of the Minnesota State Medical Association.

(6) That the secretary of the Minnesota State Medical Association transmit to the Board of Regents of the University of Minnesota, the recommendation of their House of Delegates that in addition to educational requirements to the medical school the character of applicants for admission be ascertained by confidential reports and that those not measuring up to a proper standard be rejected.

(7) That the state medical association continue their part in the State Fair Public Health exhibit.

DR. GEO. D. HEAD: It seems to me that we have had a number of reports made this afternoon by various committees in which recommendations have been made. I would like to move in accepting the report of this Committee that when we have completed our business for the afternoon the House of Delegates form itself into a Committee of the

Whole to take up the recommendations in the order in which they were presented by these various committees and act upon each recommendation separately.

DR. J. C. LITZENBERG: Something of the same thought had entered my mind on account of my one year's experience in the American Medical Association. All of these reports are referred to special committees which are appointed beforehand, and those reports are digested by the committees and a condensed recommendation brought back by the committee. It saves the trouble of the committee as a whole and saves time in acting upon them. I wonder if there is any provision, Mr. Secretary, for regular recommendation of these reports to committees. Is there any such provision in the by-laws and constitution?

THE SECRETARY: There was a provision made last year for reference committees for recommendations of this sort to be referred to. Of course all these reports are not recommendations of committees, and all that we are doing is to refer the recommendation of one committee to another committee. Reference committees may be appointed at the wish of the House of Delegates or at the discretion of the President.

DR. J. C. LITZENBERG: Then I think the purport of your motion would be that this be referred to a reference committee on public health.

DR. GEO. D. HEAD: No, I believe there are immense advantages in organizing ourselves into a committee of the whole. I am inclined to think we will have time to do that very thing this afternoon. We have certain standing committees, haven't we?

THE SECRETARY: We have certain standing committees which act as reference committees.

DR. GEO. D. HEAD: Could those standing committees be read—could those reference committees be read?

THE SECRETARY: The reports we are having this afternoon are the reports of the standing and reference committees. For instance, the committee for which Dr. Adams read the report, on sectional work, was a reference committee.

DR. GEO. D. HEAD: That is, some of the standing committees would be reference committees? If the motion was made to refer these matters to the reference committee it would mean referring them back to the same committee again in many instances?

THE SECRETARY: No, a new reference committee could be appointed.

DR. GEO. D. HEAD: Well, I think, Mr. President, that I would like to renew my motion. I believe it would be wise for us to try out this and see if we cannot act as a committee of the whole upon these valuable recommendations of these committees. It does seem a shame, as Dr. Litzenberg has said, to have such fine reports as we have had made here today and simply in a perfunctory way put them on file and not express ourselves in relation to the recommendations.

DR. W. F. BRAASCH: I think that the plan as suggested by Dr. Litzenberg is an excellent one. As adopted by the American Medical Association, theirs is a large and unwieldy body and it is very difficult to dispose of business. However, we have comparatively a small amount of business, we have a small assembly here, and therefore I wish

to second Dr. Head's recommendation that we act as a committee of the whole.

DR. J. C. LITZENBERG: Did you mean to consider all recommendations of all the committees?

DR. GEO. D. HEAD: Where recommendations have been made. In some of the reports there were no specific recommendations.

(Motion duly carried.)

THE CHAIRMAN: The Statewide Publicity Committee by Dr. Pearce.

REPORT OF THE STATEWIDE PUBLICITY COMMITTEE

This Committee has been comparatively inactive during the past year.

"The Northwestern Health Journal," which was fostered by the Minnesota Public Health Association and this Committee, is prospering and has an ever-increasing list of lay subscribers. The material in the Journal is very high class and is designed to reach the ordinary reading public.

"The Popular Health" is a new magazine now being published by the former editor of the Northwestern Health Journal, and is very much the same type of journal. It is at present in no way sponsored by any medical society or medical group, but the material is being submitted by the editor to various medical men, who are members of this society, and is uniformly good. The editor is anxious to have a committee from the State Association officially censor the material and the advertising in the magazine. This magazine is rapidly reaching a wide circulation, the editor informs now something over 15,000. It has been sponsored by the dentists of the state to the extent that they are all subscribers, and the dental material is being carefully censored by a group of dentists.

Among other publicity activities of the Committee was the radio broadcasting program. After consultation with the president, Dr. MacLaren, and the counselors, an agreement was entered into with the Dayton Company for the broadcasting of a program of popular medical topics. The program was prepared and the topics were to be given out as under the auspices of the State Medical Society, naming also the County Medical Society of which the man who prepared the talk was a member. In our agreement with the Dayton Company, there were to be no names mentioned, the talk simply being sponsored by the State and County Societies. Owing to suspension of operation by the Dayton Company and the WLAG broadcasting station, the program was not carried out. The Committee would like to know, at this time, the sentiment of the Society on the propriety, the feasibility and value of such a broadcasting program. While no advances have been made, it is possible that the new, large broadcasting station, now in the process of construction by the Washburn-Crosby Company, could be induced to give us a place on their program. If the program had been carried out, as intended, the outlines for the various talks would have been submitted to the members of this Society throughout the state, they being asked to write a popular article on the subject which would either be broadcast from the station by the author or a substitute when the author could not be present. The author's name would not be mentioned, but the article would be published in the state medical journals giving credit to the man who prepared the article.

The Committee was also interested with the Public Health Committee of this Society in promoting interest in the State Fair Health exhibitions. We believe by the showing of a little interest that the whole health program of the State Fair could be put under the auspices of the State Medical Society and the University Medical School, and that it would be a very fine form of publicity and public health work for the Society.

As the publicity work of the Society must largely be carried on under the guise of public health, there is an overlapping duplication in the existence of two committees such

as we now have, the Public Health Committee and the Statewide Publicity Committee. Therefore, it is the desire of the Statewide Publicity Committee that this Committee be discontinued as a separate committee and be continued as part of the Public Health Committee.

N. O. PEARCE, M.D.,
Chairman Statewide Publicity Committee.

DR. N. O. PEARCE: Since this report was written, the Washburn-Crosby station, this new station, has approached the Hennepin County Medical Society and the Ramsey County Medical Society with a proposition to have them take over the control of all public health and medical broadcasting from the station. They have offered to place the entire matter in the hands of the committee appointed by those organizations, at the same time requesting that the state organization either endorse or enter into the agreement. They have agreed to give us as much time as we desire, specifically stating at this time fifteen minutes between eight and eight-thirty on each Wednesday evening. I also wish to say that "Hygeia" or the health magazine of the American Medical Association have now a radio broadcasting department and they are prepared to furnish a great deal of the material that would be broadcast as medical subjects. The Hennepin County Society, or their board of trustees, have appointed a committee, and the intent is now pretty much to use the broadcasting material furnished by the American Medical Association, and to have timely talks by men who are in full time public health work, in addition. I think it would be a very important thing for the House of Delegates to consider this question of radio broadcasting and to enter into a committee co-operation with the Hennepin County and Ramsey County societies who are prepared to go ahead with this program.

(Moved, seconded and carried that the report be adopted.)

THE CHAIRMAN: Dr. Ritchie is here and will report on the Annual Congress of Medical Education, please.

REPORT OF THE REPRESENTATIVE TO THE ANNUAL CONGRESS ON MEDICAL EDUCATION, MEDICAL LICENSURE, PUBLIC HEALTH AND HOSPITALS

Fortunately for the delegate to the Annual Congress on Medical Education, Medical Licensure, Public Health and Hospitals, the press of the American Medical Association is now incorporating the proceedings in pamphlet form, which this year includes 102 pages of closely printed material.

Formerly, the delegate attempted to scan the proceedings in a report, an attempt which you can appreciate would be of little value. Those of you interested in medical education, will find most interesting discussions upon policies in undergraduate teaching, in postgraduate teaching, in medical extension work, all incorporated in this extensive report. Similarly, those interested in the problems of regulation of practice by law, the relation of the profession to the various sects and cults in healing, will also obtain much information. Those of you particularly interested in hospital service will find much upon the measures which indicate efficiency in hospital administration, the wonderful information and plans for increasing the autopsy percentage and also its effect upon the demand and supply of interns. Those of you interested in public health will find various plans for periodic health examinations, organization of county medical societies for the dissemination of information for the benefit of the public.

In every former report, your delegate has been most enthusiastic concerning the high plane of the papers as well as the splendid personnel of the meeting, including, as it

does, presidents of universities, deans of medical schools, head masters in various departments of the teaching profession. This meeting is open to anyone, and everyone is always made most welcome. It meets every year at the same place, the Congress Hotel, Chicago, and usually at the same time, early in March.

Respectfully submitted,

HARRY P. RITCHIE.

(On motion duly seconded and carried the report was accepted.)

THE CHAIRMAN: Any new business?

DR. F. S. WARREN: Before we adjourn this meeting I would like to say a few words on the Harrison Act and that recommendation to put the tax back to one dollar as it was before the war. It seems strange to me that the doctor should be called upon to pay any fee at all, and I would recommend that we ask that the fee be entirely abolished. I note that in the American Medical Journal, for January 24 I think it was, of this year, it was stated that it was probably necessary to put a one dollar tax with this law so that it would be perfectly legal. Well, now, why the profession should carry that law when it is a law calling for the reform of the whole country, I cannot understand. If the people want that law why doesn't the payment for its enforcement come from the general treasury? I understand that in 1922 \$613,000 in excess of that necessary for enforcing that law was collected, and that was paid to the general treasury of the United States. If so, we are being taxed excessively. I would recommend that that tax be entirely wiped out, and let the general treasury of the government carry the payment.

THE CHAIRMAN: If there is nothing further in the way of business we can take up these recommendations.

DR. W. F. BRAASCH: I would like to bring before your attention a matter which has interested me a great deal in the last few months and that is a progressive step which has been taken already by eight state associations, namely the adoption of a full time secretary. Unquestionably this is a movement which is necessary with the changing conditions and the many demands upon the State Medical Association. In the suggestion I do not wish to criticize in the least the present secretary, who has done so well, nor the management of the journal, which is also ably conducted; but there are so many demands for the secretary and so many opportunities for a man who can devote his full time to the work that it seems to me we should seriously consider the adoption of such a provision.

I wrote to Dr. West, secretary of the A. M. A., for information on this subject and he told me that there are already seven states, and possibly eight, that have adopted the full time secretary. It has been their experience—and some of them have had it for two and three years—that it has been of the greatest benefit to the state medical association. He also said that in his opinion any state association with a membership of more than fourteen hundred (and we have almost two thousand) should have a full time secretary in order to be most efficient.

I wrote to several of the secretaries, particularly the Ohio State Medical Association, which association has a full time secretary since three or four years even, and he writes me a letter from which I will quote liberally. (Reads letter.)

And now from the secretary of the State Medical Society

of Wisconsin I have also a letter which points out a number of advantages of a full time secretary. (Reads.)

The executive secretary could work with the laity on matters pertaining to public health and the amalgamation of various organizations that are already functioning, economy of concentration of one man, and he could also remain as the editor of the journal, and he could act in an advisory capacity. As it is now, the chairman of the various sections each year is appointed and discharged, and his experience is lost. A new man who has had no experience is supposed to carry on the work, and under his guidance, which will be continuous all the year, he will have a better opportunity to be of aid.

Now, as I said before, we have an excellent secretary; we can not criticize the work of our present secretary, but it stands to reason that a man who can devote all his time to the work and with established headquarters can accomplish a great deal more. He can also help to round up some five or six hundred physicians, I am informed, who are not members of this association; and he can organize and revive the county medical societies and help them in a thousand and one ways. Therefore I would present this matter first for your consideration.

DR. W. A. JONES: May I ask a question as to the expense of such a man?

DR. W. F. BRAASCH: In regard to the expense of such a move, it would unquestionably mean an increase in the society dues. It will entail an expense of possibly five thousand dollars for the salary of such an executive full time secretary. Several of the states have employed laymen, claiming that a layman will have possibly greater business ability and will be in closer touch with the public, particularly a layman who has had some newspaper experience. However, this is not necessary at all. We already have the journal taken care of and at a very economical rate. I think there are advantages in this state under these peculiar conditions in having a physician rather than a layman. I believe, however, that we could not hope to have any physician of ability to officiate for certainly less than five thousand dollars.

As to the method of meeting this large increase, we are now paying five dollars; of those dues two dollars are being devoted to legal defense. It is a matter which unquestionably should be brought up for consideration also before this body, and it already has been brought up for consideration: whether or not we are justified in continuing this legal bureau and whether we are getting value for the money expended. It seems to me that it does not officiate at all as it should. We are paying two dollars for something that we do not get except in a limited way. We really have no legal defense at all as far as that goes, except that we have attorneys, but there is no compensation offered. Furthermore, there are a number of arguments which could be brought up to obviate that. Take these two dollars and apply them toward the secretary's salary. It would mean an increase of a comparatively small amount in the present dues, possibly two dollars more, so as to make the present dues seven dollars. I am sure it has been the experience of the men that I have talked to in other state societies and of the secretaries that the members of the society more than feel repaid for the extra expense by the increased work that

the state society does and by the great increase of influence it has upon the laymen.

DR. J. G. CROSS: If Dr. Braasch makes that as a motion, I suppose the committee as a whole ought to vote on it.

DR. W. F. BRAASCH: We have a contingency which arises now which should be met, namely, you have heard that our worthy secretary has offered his resignation, and I think it has been accepted. He is, however, willing to continue until January 1st in his present position, so we have until January first if the society wishes, to consider and to adopt, at least tentatively, such a program.

DR. J. G. CROSS: Would you think that this was a matter to be referred to the Council?

DR. H. M. WORKMAN: In explanation I will say that this matter came before the Council and the president of the Council appointed a committee to consider or to see for what they could secure a full time secretary. I am not in a position to say what we would have to pay, but there was a committee appointed by the Council, if the House of Delegates should approve the securing of a full time secretary, to see what one could be secured for and to have him begin work then after the expiration of Dr. Drake's time. That would do away with electing a secretary, if the House of Delegates will approve the recommendation of Dr. Braasch. In order to get it before the house, I would like to move that Dr. Braasch's recommendation be adopted.

(Motion seconded.)

DR. H. L. TAYLOR: I would like to ask Dr. Braasch what the dues are that are paid by the Wisconsin State Medical Society. I asked about that during recess at noon and I understand that they are paying fourteen dollars.

DR. W. F. BRAASCH: I am quite certain that you are wrong. The dues in the Ohio State Medical Society are nine dollars, and the dues in the Wisconsin Medical Society are eight dollars, as I was informed.

DR. H. L. TAYLOR: I was very credibly informed that they are fourteen at the present time, and that the Ohio State Medical Society has a very much larger membership. As far as organizing the state organization is concerned, we are thoroughly well organized, with over nineteen hundred members and six hundred practitioners that are not members. I would like to know how many of those six hundred we would be willing to receive even if our full time secretary rounded them up.

DR. W. F. BRAASCH: I am quite certain that you are mistaken as to the fourteen dollars, Dr. Taylor. I am sure that the dues will not be more than eight or nine dollars at the most, and I believe that with this cancellation of the clause for legal defense they can be reduced to seven dollars surely. As you say, unquestionably the journal is well taken care of by Mr. Bruce; and in talking this over with the Council and others, we felt that we ought to continue Mr. Bruce in his present capacity. That will of course reduce the work of the secretary, but will give him a greater opportunity for lay work and for coordinating these various organizations that are now uncoordinated and that are overlapping. I think you will have to leave it to the judgment of the committee from the Council, if you adopt this motion, to see that the dues will not be exorbitant, that they will not be more than nine dollars.

DR. W. A. COVENTRY: Might there not be a difference

of understanding on that? Eight dollars state dues, but fourteen dollars county dues of which eight dollars is for the state.

DR. C. B. WRIGHT: Wouldn't it be advisable to settle this first in the local societies? A few of us who are interested in the local societies find that at present the dues are getting a little strong. I think it might be advisable to have this matter presented for endorsement by some of the local societies before it is carried out. I rather think that at the present time many of the local societies wonder what they are paying all this money for. I have heard that criticism many times, and I believe that some method ought to be used to sell this thing in an enthusiastic way to the members of the local organizations. That is my experience. Personally I have heard that criticism, and if you are going to raise the dues without first getting the endorsement at least to some extent of the local societies who make up this organization, I think we may find a difficulty in putting it over.

DR. L. SOGGE: I fully agree with this last speaker. I for one will not be willing to vote before I know what it is going to cost. A good many of us did that a few years ago and we have suffered a whole lot for it. So I would like to know what the dues would be if we had a full time secretary before I would want to vote on it, and I think it would be pretty hard to vote until I had referred it back to my own society. I think that we ought to have a vote from the local society first and know how much the dues are going to be and then vote on it in the society, because if we raise the dues very much I am afraid we are going to lose some of the members down in our section of the country. I am not sure now of the percentage but I believe that about seventy-five per cent of the men down there are carrying individual liability and still they are paying those dues into the society every year, and they are getting tired of it. They have absolutely no benefit from that liability, because I know there have been quite a few suits down in there brought for malpractice but they all used their individual Fort Wayne insurance that practically all of them carry. I think it would be a good thing if we take away that liability insurance, and if it would not raise the dues very much I think the full time secretary is a mighty good thing, but we do not want the dues too high.

DR. H. M. WORKMAN: I want to just say one word in explanation for the Council. I do not think it is the idea of the Council to ask any increase in the dues at this time. What the Council appointed the committee for was to see what they could secure a full time secretary for under our present assessment, not to increase the dues until we come back to you with what it can be done for with the present assessment. This two dollars for insurance will have to be enforced for six years, even if we repeal it now, until the expiration of the liability occurs. Any man who is now a member of this society, even if we stop the insurance at this time, would have to be defended for the next six years, and we would have to keep up this two dollars for six years anyway.

If we can get a full time secretary and continue the dues what they are now, why we will be that much better off; and that was the idea of the committee that the Council appointed to investigate this matter and see if we could

not find somebody to do that for the time being until we got this thing going.

THE SECRETARY: Inasmuch as I have been the secretary for four years and am retiring, I just want to say a few things in regard to this proposition. I was one of the committee appointed with Dr. Braasch and Dr. Workman to present this thing to the House of Delegates for the Council. There isn't any question in my mind but what it would be much better for the association and its affairs in every way to have a full time layman to handle the business side of the association. Other associations have had great difficulty in getting just the right type of man to do that, a man who will go out and help county societies organize and help increase the membership of the association. It is doubtful in my mind whether we could get a man who was worth while to do that for less than five thousand dollars. That means five thousand dollars more than the hundred dollars a month that we are paying now. We are paying one hundred dollars a month, which is a ridiculously low sum for organization purposes, that is, for somebody to handle and keep track of the membership and all the details. That is just twelve hundred dollars a year.

Now if you had a high salaried man, that is, a man with a four or five thousand dollar salary, he isn't going to work the typewriter; he isn't going to keep all these records. He will have a stenographer, and you can't get a stenographer nowadays for less than a hundred dollars a month who is worth anything. Another item is rent; and you can't get an office for less than forty or fifty dollars a month. You will incur a rather big expense.

There isn't any question in my mind but what this is a fine thing, but I really think that a committee ought to be appointed to go into the financial side of it and consider it thoroughly before any action is taken. I would be in favor of it, and I would be willing to pay nine dollars, which is the figure that I got from Wisconsin a year ago at Chicago at the secretaries' meeting when I spoke to the executive secretary of the Wisconsin Medical Association. He said that the dues had been raised from four to nine dollars. He also said that the advertising in the state journal was so much more since he had become executive secretary that such a marked increase in the dues would not have been necessary. In putting this proposition into effect in Minnesota we are not considering putting this manager in charge of the journal too, so that this is no argument for adopting such a measure.

I really think that the solution of this problem is to find out exactly how much money it is going to cost. The state association was only five hundred dollars ahead of the game this year, which is pretty close sailing. To attempt what looks to me like a seven or eight thousand dollar proposition ought to be looked into pretty carefully before it is adopted, because I am afraid the members of the state association may not think that they are getting their money's worth if we raise the dues to nine dollars.

DR. W. F. BRAASCH: This is from the secretary of the State Medical Association in Wisconsin. I should have read it before. (Reads letter.)

And may I also say that it was my original intention to bring this merely for your consideration, but in view of the fact that the first of January we will have no secretary and will have to hunt around to get one temporarily at least,

it appeared to the Council that this might be an opportunity to try out this method.

DR. C. P. WRIGHT: I do not want to be misunderstood on this proposition. I am absolutely in favor of it. I think it would be a wonderful thing for the entire medical profession in Minnesota, but I still believe that it would be better to approach the matter in a way so that everyone will understand exactly what that is for and the local organizations be entirely in sympathy with it. I believe you can work up such a sentiment, and I think it would be a tremendously valuable thing if you can do it. Now I would like to make a motion that this recommendation be referred to the local societies which are component parts of this organization for their endorsement.

(Motion seconded.)

THE CHAIRMAN: There is a motion before the house, I think, now.

DR. W. A. COVENTRY: May we have the motion, please?

THE CHAIRMAN: Dr. Braasch, will you make your motion again?

(The Secretary read Dr. Workman's motion as follows: I would like to move that Dr. Braasch's recommendation be adopted.)

DR. W. F. BRAASCH: Let me repeat the body of my recommendation in a few words: That the committee appointed by the Council be allowed to continue in the investigation as to the ways and means of financing a full time secretary, and if in their judgment it is feasible that he be appointed to take the place of the retiring secretary without an increase in dues.

THE CHAIRMAN: Without an increase in dues. Is that all understood? Are you ready for the question?

(The motion having been declared carried in the usual manner, there was call for a rising vote, which being taken, showed twenty-four in favor and twelve opposed.)

DR. C. B. WRIGHT: I move that this motion be referred to the local societies for their endorsement. The reason I say that is because I think it is a good thing to get the local societies in on this. I have had a little experience with one society, and you want your society back of you. I believe there are a good many men here who will agree that if you can get co-operation from your local society you will get much further. Therefore I make that motion.

(Motion seconded and carried.)

THE CHAIRMAN: Now the recommendations that we have here in these papers will be taken as the Secretary comes to them.

DR. J. G. CROSS: I beg your pardon, are we now a Committee of the Whole?

THE CHAIRMAN: Yes.

THE SECRETARY: The matter of the physicians who have become incapacitated or are in straitened circumstances. It was the consensus of opinion in the Council that this matter should be taken up before the House of Delegates. I might state in connection with this that I received a communication from Dr. A. W. Ide, of St. Paul, written when Dr. Beebe was a patient at the Northern Pacific Hospital in St. Paul. He stated that the situation was really brought to his attention by the case of Dr. Beebe. Dr. Beebe was in need of financial help, and the thought occurred to Dr. Ide that it would be a fine thing if the Minnesota State Medical Association could start a fund to provide for mem-

bers of the association who are in straitened circumstances, due to sickness or accident or old age. A letter was written by Dr. Ide to Dr. MacLaren, and Dr. MacLaren being ill was unable to act upon the situation, so the copy of the letter was sent to me, and I thought it only proper to bring it before the delegates. Reference was made to an article which appeared in "Clinical Medicine" on a proposition which had just been undertaken in New York State where a country place was presented to the society which was gotten up by the doctors of the state to provide for such unfortunate members of the profession. The idea of this New York society was to have it of rather national scope, the New York society being the first unit to be established. I am simply bringing it to your attention. I don't know whether it has ever been brought to the attention of the state medical association before. I am not going to put it in the form of a motion, but if anybody believes that this is worth while or advisable it seems to me a motion would be in order to perhaps refer it to a reference committee.

DR. GEO. D. HEAD: Would a motion be in order to refer this matter to the Council with power to act or set aside a certain sum for this purpose out of the money available?

THE CHAIRMAN: I think so. I think that if the House of Delegates so ruled the Council would have authority to act.

DR. GEO. D. HEAD: I would make such a motion, that we refer to the Council with power to act the matter of setting aside a specific sum of money to assist members of the association that are in real need.

(Motion duly seconded and carried.)

DR. J. G. CROSS: Before we are too far along in this, may I ask the Chair to rule whether in committee of the whole it is proper to provide for the sending of a message of regret to our President? That, it seems to me, ought to go forward without any delay. I would move you that the Secretary be instructed to send a message by wire to the President, Dr. MacLaren, suitably expressing our regret that his illness prevents his being among us.

(Motion seconded and carried.)

THE SECRETARY: These are the recommendations from the report of the Committee on Public Health: (1) That local committees on legislation be continued in every county society in the state.

(Motion to adopt recommendation seconded and carried.)

THE SECRETARY: (2) That local committees on public health in every county society take an active interest in all local public health matters.

DR. C. L. SCOFIELD (Benson): I believe that in most county societies there are no such committees and that it would be advisable to change that to provide for such public health committees in county societies and then add this recommendation do it. If I am correct in that statement, I would move that county societies be requested to appoint public health committees and that these recommendations be followed.

(Motion seconded and carried.)

THE SECRETARY: (3) That radio broadcasting on public health matters be undertaken as soon as possible under the auspices of the statewide publicity committee, that such talks be announced as being given under the auspices of the Minnesota State Medical Association and the County medical society, but that the name of the speaker shall not

be announced if he is engaged in the active practice of medicine.

I might say that in the report of the publicity committee they have recommended that their committee be terminated. We ought to take that into consideration in acting on this.

DR. FRANK SAVAGE (St. Paul): May I have the privilege of the floor? I am not a member of the House of Delegates. This matter has been a regular storm center of discussion. It has been threshed out in Hennepin County; it has been threshed out in Ramsey County. The general consensus of opinion is that it would create bad feeling if a certain few were selected and their names were announced. The viewpoint of the radio corporations up to this time, especially WLAG, has been that these talks are of no value unless the names are announced. Dr. Wright's viewpoint on that was to let them come to the viewpoint of the medical men or not get the material. They have been very anxious to get the material. Now as Dr. Pearce has stated today, they are ready to accept this proposition, and it is the idea to establish these radio talks to be given under the auspices of the State Medical Association sponsored by some county medical society, and make the radio companies either take that or we will not give the talks to them, and establish that principle in order to create good feeling and not bad feeling. It doesn't make any difference under whose auspices this is undertaken, but I would like to see that principle established; that the name of the speaker be not announced if he is engaged in the active practice of medicine. I think that is a very important thing, and those who have given it time and thought I think are unanimous in that conclusion.

DR. C. B. WRIGHT (Minneapolis): In Hennepin County we had this matter before us the last two or three years. How it came up first was through the request of a number of men who are on the fringe of the medical question who asked us to allow them to talk over the radio. The thing was threshed out very thoroughly. The chairman of the publicity committee took this question up, and this was the only solution of it which we decided would be without discussion and would create no feeling. For instance, as Dr. Fishbein said in his talk in Minneapolis, he gave a talk himself, a full time man in the employ of the American Medical Association, and the next morning he had twenty-five or thirty calls over the telephone and letters asking him for a consultation in his office. The whole thing is new, and it seems better to approach it from a perfectly safe standpoint. As there are probably fifty men in full time work in this state, through the University and other places, it seemed to us that this would be the advisable thing to do.

Now as you know Washburn-Crosby have taken over WLAG, and through the help of public spirited citizens of Minneapolis and St. Paul, who have contributed a large amount of money, they are putting in a very expensive radio which, when completed, will broadcast all around the world. We had a consultation with them, Mr. Wilbur and Major Harrison, who are directing this thing, and they are very anxious to co-operate with us. They are anxious to put on something which will be of real service to the Northwest in the way of market reports and various other things which will be of value. They are not so particular about whether it is going to be the thing which goes over quick;

they want to develop something which is of educational value. They are very willing, I think, that we use the clippings of "Hygeia" which are sent every month, reinforced by talks by various public health men on subjects of live interest. They are very anxious to co-operate, and I think it would be a great mistake to step backward, because we have got to the point where we must advance.

(Motion to adopt the third recommendation of the Public Health Committee seconded and carried.)

THE SECRETARY: (4) That the Minnesota Public Health Association be asked to broaden the scope of their work to include the sending of selected articles on public health to the newspapers of the state at regular intervals and to obtain the newspapers' co-operation for their publication.

(Recommendation adopted.)

THE SECRETARY: (5) That the association endorse the Northwestern Health Journal and permit the management to state that it is the official journal for the public of the Minnesota State Medical Association.

DR. GEO. D. HEAD (Minneapolis): I would like to raise the question as to whether or not it would be wise to state that it is the official journal for our association. Unless we have fairly definite control, I doubt that we ought to allow our name to be published as being represented by this journal or endorsing the journal and having our name put in the journal as its representing us officially. Wouldn't it be just a little bit dangerous perhaps unless we had some way of passing upon or editing the material that goes in? I know the Northwestern Health Journal is a splendid magazine and we all endorse it, but isn't that sufficient without putting our name upon it? I just raise the question.

(Dr. H. M. Workman moved that the association endorse the Northwestern Health Journal but that the second part of the recommendation be omitted. After considerable discussion the motion was carried.)

THE SECRETARY: (6) That the Secretary of the Minnesota State Medical Association transmit to the Board of Regents of the University of Minnesota, the recommendation of their House of Delegates that in addition to educational requirements to the medical school that the character of applicants for admission be ascertained by confidential reports and that those not measuring up to a proper standard be rejected.

DR. GEO. D. HEAD (Minneapolis): I would like to ask whether or not this matter has been submitted to the dean of the medical school and the dean of the post-graduate school before the recommendation was made.

DR. J. C. LITZENBERG (Minneapolis): I do not know. I haven't heard of it.

DR. GEO. D. HEAD (Minneapolis): Wouldn't it be wise, since this is rather drastic for applicants to the medical school, first to have some advice from the authorities before acting on it, or make it with the approval of the dean? I would amend the recommendation by inserting the words: "With the approval of the dean of the medical school."

(Recommendation adopted as amended.)

THE SECRETARY: That the State Medical Association continue its part in the State Fair Public Health exhibit.

(Recommendation adopted.)

THE SECRETARY: I would like to bring before the house

the question of whether or not the Statewide Publicity Committee is to be discontinued as they wish.

DR. N. O. PEARCE (Minneapolis): As chairman of that Statewide Publicity Committee, my reason for recommending that this committee be discontinued and merged with the Public Health Committee is that there is no distinct line of demarcation between the two groups. Everything that I reported was already touched on in the report of the Public Health Committee. I believe that it is unnecessary and makes a cumbersome machine to do the work if you have too many machines that are working on too closely related subjects. To me it seems there are two distinct things that the Public Health Committee should have to do. One of them is to keep in contact with all public health organizations doing public health work throughout the state, keep in medical touch with those organizations and do what is possible to keep them all up in the proper spirit of activity. The other is the medical propaganda in order to get an intelligent public medical viewpoint. That I consider is the work of the Statewide Publicity Committee, trying to create an intelligent medical viewpoint on the part of the public. At the same time, the work is so closely associated that it would be much better taken up if one committee had charge of this program of public health activity and if that was just a department of the public health committee. Therefore we recommended that the Statewide Publicity Committee as a separate committee be discontinued and be provided for in the appointment of the new Public Health Committee.

(On motion, the Committee of the Whole dissolved and again became the House of Delegates.)

DR. J. C. LITZENBERG (Minneapolis): I move that we listen to the report of the Committee of the Whole. Nothing that was adopted in the committee is of any force until it is adopted by the house. The Secretary can report for the Committee of the Whole.

THE SECRETARY: Gentlemen, certain recommendations have been made by the Committee of the Whole; you all know them. You notice that I am called upon to make the report. I make the motion that the suggestions which have been taken down by the stenographer and which you all know be adopted by the House of Delegates.

(Motion seconded and carried.)

A MEMBER: May I have the privilege of the floor? Dr. Workman suggested that if we discontinue our defense of malpractice we would have to continue defense of those who are in for at least six years. I would like to make a motion that the members of the committee use their best efforts in the state of Minnesota to have some specific legislation passed to limit it to two years as they have in our neighboring state of Iowa and other states that I know of.

(Motion seconded and carried.)

THE CHAIRMAN: What is your further pleasure?

DR. GEO. D. HEAD (Minneapolis): I move that when we adjourn that the House of Delegates adjourn to meet at one o'clock tomorrow.

DR. W. A. COVENTRY (Duluth): Last year we had this same sort of wrangling that we have had this afternoon, all in a friendly spirit, however. It seems to me that the business of this House of Delegates is not handled the way it is in most organizations that I have been mixed up in.

I would like to offer this amendment to the by-laws to be acted on tomorrow: That there be appointed by the president on the first day of the session of the House of Delegates a committee on resolutions consisting of five members to whom shall be referred all recommendations submitted to that session, reporting their findings for action at the last day of the session.

DR. H. M. WORKMAN (Tracy): I will make that the second day of the session.

DR. W. A. COVENTRY (Duluth): I will accept that amendment.

(Amendment seconded.)

THE SECRETARY: I think that is going to mean that the House of Delegates will have to go into a committee of the whole on the second day if that resolution is made. Now all these recommendations have already been thought over for a year before they are proposed to the House of Delegates. Why have another committee to pass on all of this when the House of Delegates is here to discuss these things? It would be well to hold the recommendations over until the next day, but I believe as Dr. Head does that this House of Delegates ought to go into a committee of the whole and discuss these things just the way we have done this afternoon. I am afraid that if we just refer all these recommendations to five men there will be very little chance for any open discussion, which I think is the function of this House of Delegates. If we go into a committee of the whole on the second day—which of course would obviate that—it would mean a long drawn out session on the second day, and I think that ought to be considered.

DR. W. A. COVENTRY (Duluth): My idea was to avoid all this terrible confusion. We do not know what we are talking about half the time. If the committee has this definite recommendation before it drawn up in some sort of form to present to this House of Delegates, you can have it in the committee of the whole if you wish, but you have something definite to work upon. As it is now, it is a question of confusing the stenographer and going back over a lot of pages and not knowing what we are trying to find. It is a question of whether it is better for the committee to work through the year and report to the house or better to report to a special committee and let the committee get things in hand before presenting them to the committee of the whole. I am trying to find some way of getting out of this terrible confusion.

DR. H. M. WORKMAN (Tracy): Well, I second Dr. Coventry's motion. The idea is this: We come here as delegates on the first day with nothing to do, and on the second day we will be denied the privilege of attending any sessions and we will take just as much time the second day as we have taken this afternoon. The members of the Council and the House of Delegates are here to attend the meetings, too, and they are going to be denied that privilege.

DR. W. A. COVENTRY (Duluth): In order to facilitate business a little bit, may I ask Dr. Workman if he would have any objection to having it so that recommendations can be referred to this committee beforehand.

DR. H. M. WORKMAN (Tracy): I don't care when they come in; I just want them so we can discuss them.

A MEMBER: I don't see how a committee of five can display any more intelligence after a consideration of a few

hours than the author of the report did after a year's consideration.

DR. B. W. KELLY (Aitkin): Some recommendations made by one committee may be made in a form somewhat different by another committee. In other organizations any resolution to be put before the house must be submitted to the resolutions committee. If we had such a method we would then do away with the greater part of the confusion we have had this afternoon, and the resolutions committee could have had the report on the first day, could have every resolution in concrete, proper grammatical form and proper construction, ready for consideration, and it could be considered by the committee of the whole as has been done today, but without so much confusion. I believe Dr. Coventry would be willing to amend his own motion to that effect, that all resolutions coming before the House of Delegates should come through the committee on resolutions, the report to be submitted on the first day.

A MEMBER: There is just one little bit of differentiation. There have been practically no resolutions brought in; they have been practically all recommendations. I question whether these recommendations should be referred off to some committee of five men to decide upon after these standing committees have been working on them for an entire year. It is not as though they were bringing in resolutions. These are recommendations for the House of Delegates.

DR. B. W. KELLY: I accept that criticism, Mr. Chairman, and still hold to the idea that a recommendation to be made before this house for adoption should come in the form of a resolution. If these all pass through a standing committee on resolutions which would be in session at the opening of this house and immediately preceding, they could be considering these various matters and report when the preliminary business of the House of Delegates had been concluded. That is to say, by the time the reports of the various committees had been heard, these recommendations could be put in the form of resolutions together with other resolutions that any individual member might wish to submit to the house and would be ready for prompt action then, adoption or rejection by the house.

DR. W. A. COVENTRY (Duluth): There is no question. This is an amendment to the by-laws and it has to lay on the table until the meeting tomorrow. This is just offered for your recommendation and action tomorrow.

THE CHAIRMAN: Any further business?

DR. C. L. SCOFIELD (Benson): Now being in order and in view of what has gone before, I would renew my motion that the Council be instructed to reorganize our list of committees.

(Motion duly seconded and carried.)

On motion the meeting of the House of Delegates adjourned until one o'clock the following day.

SECOND MEETING OF THE HOUSE OF DELEGATES THURSDAY, OCTOBER 9th

The House of Delegates met pursuant to adjournment at 1:00 P. M., and was called to order by the first vice-president, Dr. E. T. Sanderson.

The secretary was instructed to read a summary of the minutes of the previous meeting, which were accepted as read.

The President called for a supplementary report of the Credentials Committee and Dr. Braasch reported the following as in attendance in addition to those present at the Wednesday afternoon session:

Hennepin County—Dr. L. A. Nippert, Minneapolis.

Nicollet-LeSueur County—Dr. S. Ericson, LeSueur.

Ramsey County—Dr. E. M. Jones, St. Paul (alternate for Dr. Geo. Geist).

Upper Mississippi—Dr. J. A. Thabes, Brainerd.

Washington County—Dr. W. R. Humphrey, Stillwater.

Winona County—Dr. I. W. Steiner, Winona.

The next order of business was the election of officers and nominations for president were called for.

Dr. W. A. Jones nominated for president Dr. A. S. Hamilton, of Minneapolis.

DR. G. S. WATTAM: Mr. President, I nominate Dr. W. L. Burnap, of Fergus Falls, for president. The presidency of our Association should be given to a member of this body who is a resident of St. Paul, one year; the next year from Minneapolis, and the third year to a member in the outside districts. We have at this time the right to ask that northwestern Minnesota west of St. Cloud be represented. We have never had a president of this Association. We believe that northwestern Minnesota is entitled to that consideration. Dr. Burnap has been one of the staunchest members of this Association for many years. He is at present Councilor for the First District of this Association. I do not believe that this rules him out of being placed in nomination. I know that he will fill the office of president of this Association well, if he is elected.

As there were no further nominations, the names of Dr. Hamilton and Dr. Burnap were balloted upon, Dr. Burnap receiving thirty-two votes and Dr. Hamilton, eleven.

It was moved that the election be declared unanimous for Dr. Burnap. The motion was seconded and carried.

The following officers were nominated and declared duly elected:

First Vice President—Dr. A. S. Hamilton, Minneapolis.

Second Vice President—Dr. John Libert, St. Cloud.

Third Vice President—Dr. C. W. More, Eveleth.

Secretary—Dr. Carl B. Drake, St. Paul (re-elected).

Treasurer—Dr. F. L. Beckley, St. Paul (re-elected).

Councilor for the First District—Dr. G. S. Wattam, Warren.

Councilor for the Fourth District—Dr. W. H. Condit, Minneapolis.

Councilor for the Seventh District—Dr. F. A. Dodge, LeSueur.

The appointment of Dr. H. Longstreet Taylor, St. Paul, to succeed Dr. W. A. Dennis as Councilor of the Third District, following the death of Dr. Dennis in November, 1923, was approved by motion, which was seconded and carried.

THE SECRETARY: I would like to state that my resignation as secretary of this Association had been accepted prior to this meeting and that if I consent to being re-elected that it be with the understanding that a full-time secretary be appointed to take over this work. I will again tender my resignation at that time.

THE PRESIDENT: We will now take up the election of delegates to the American Medical Association. This year we are entitled to a third delegate to the American Medical Association upon the basis of one delegate to each 950 members. Our constitution provides that the election of these

delegates conform to the laws of the American Medical Association.

Dr. J. L. Rothrock was nominated and declared duly elected as Delegate to the American Medical Association.

The names of Dr. J. F. Corbett, Minneapolis, Dr. T. L. Chapman, Duluth, and Dr. J. G. Cross, Minneapolis, were proposed for election as the third Delegate to the American Medical Association. As the first ballot gave no majority vote, a second ballot was cast, resulting in the election of Dr. Chapman.

Dr. J. G. Cross, Minneapolis, as alternate for Dr. Rothrock, and Dr. Theo. Bratrud, Warren, as alternate for Dr. Chapman, were nominated and declared unanimously elected.

Dr. H. M. WORKMAN: Mr. President, I would like to propose an amendment to the constitution. Whenever the chairmen of the various committees come in here to make their reports they have to ask the privilege of the floor in order to address the House. I would therefore add to Article V—"also the chairmen of the various appointed committees and the delegates to the American Medical Association, but without vote."

Dr. W. A. JONES: I move that the amendment be referred.

Seconded and carried.

Dr. W. H. CONDIT: Mr. Chairman, may I present the matter of the next meeting at this time? I would like to invite the Association to meet in Minneapolis next year.

Dr. C. L. SCOFIELD: It has been suggested that if possible these meetings be held on the University campus and I would like to move therefore that the next meeting be held on the University campus if arrangements can be made to do so.

Dr. W. A. JONES: There are a few difficulties to contend with in meeting on the University campus. The Hennepin County Medical Society has in view something for next year, in which they hope the State Association will join. There is no auditorium on the campus large enough and no auditorium available after September. We have been forced to go outside for an auditorium. This is a very serious objection.

Motion was made, seconded and carried to accept Dr. Condit's invitation to meet in Minneapolis next year.

THE SECRETARY: It will be up to the Council to decide on the time when this meeting is to be held. I have heard that there may be a meeting of the Tri-State Association in Minneapolis in October of next year.

Dr. W. A. JONES: It has not been determined definitely.

THE PRESIDENT: We will now have the report of the Reference Committee. Dr. Braasch.

Dr. BRAASCH: Your committee suggests that the House of Delegates recommend to the next Program Committee that more combined meetings be held and that the program consist largely of clinical presentations and papers read in abstract.

(Signed)

W. F. BRAASCH,
W. A. JONES,
GEORGE D. HEAD.

A MEMBER: I move that the report of the committee be adopted.

Dr. B. S. ADAMS: The papers that we get at the state

medical meetings are helpful and interesting. Would this recommendation mean any curtailing in the character or in the number and quality of the papers we are going to have?

Dr. W. F. BRAASCH: Of course, the idea is that in keeping with the present policy—to hold as many clinical presentations as possible and to avoid the long tedious paper which is devoid, more or less, of interest. This plan gives an opportunity for many more clinical presentations than by the former method. I think there would be plenty of opportunity for what you refer to.

Dr. B. S. ADAMS: I think it would be too bad if we do not have some good papers for our journal.

Dr. W. F. BRAASCH: There would be plenty of material for the journal.

The motion that the report of the committee be accepted was seconded and carried.

Dr. J. W. BELL: Mr. President, in the matter of employing a full-time secretary, I would like to inquire whether the idea of the assembly was to have a medical man. I wasn't quite clear on that point when the matter was brought up before.

Dr. W. F. BRAASCH: It is the intention of that committee to have a physician as secretary.

THE SECRETARY: I wish to ask the opinion of the House on the advisability of having a full-time secretary. Was it the wish of the House that the motion stand as Dr. Wright gave it?

Dr. C. B. WRIGHT: The motion was not in very definite form. It was simply left to the Council to provide ways and means. There is nothing definite to refer to the Society at this time. If a full-time secretary can be procured without increasing the dues there will be no need to refer the matter to the local societies. If the dues are increased, the matter should be referred to the local societies. I therefore move that if it is necessary to increase the dues of the local societies to provide a full time secretary, that this matter be referred to the local societies for their decision before definite action is taken.

A MEMBER: A motion has already been passed that the matter be referred to the local societies. It is a question of whether this should be done by the secretary or the delegates.

Dr. H. M. WORKMAN: I second the motion of Dr. Wright.

The motion was carried.

THE PRESIDENT: Is there anything to come before the meeting under Old Business?

THE SECRETARY: The Legislative Committee in their report brought up a communication received from the American Medical Association headquarters asking that this state association confirm some resolution made by the American Medical Association in order to get more pressure to bear on Congress. I have not had time to go through the material. The Legislative Committee did not leave an outline with me. I think it would be safe to take action to carry out this request of Dr. Woodward.

A MEMBER: I move that the State Association confirm the resolutions of the American Medical Association.

Dr. J. W. BELL: May we have the suggestions of Dr. Woodward?

THE SECRETARY: Dr. Woodward requests that we take

action on the following propositions which have received the approval of the American Medical Association House of Delegates or the Board of Trustees:

The endorsement of a bill now pending in Congress requiring the labeling of packages containing lye and other caustic substance as poison.

A resolution passed by the American Medical Association House of Delegates expressing its disapproval of the portion of the National Prohibition act which limits the prescribing of liquor by physicians on the ground of this being interference with proper relations between physician and patient.

The reduction of the war tax imposed under the Harrison Narcotic law from \$3.00 to \$1.00.

Fostering legislation placing cosmetic preparations under the Food and Drug act.

The creation of a federal department of Education and Relief comprising a Bureau of Public Health and a Bureau of Relief.

Relief for the medical profession, which will enable a physician to charge up traveling expenses to and from medical meetings to professional expense.

DR. W. A. JONES: I move that the secretary be instructed to cast the vote of the House of Delegates.

DR. WARREN: I would like to see the Minnesota State Medical Association go on record as asking that the narcotic tax imposed on physicians by the Harrison Narcotic Act be entirely wiped out. If the United States wants to institute a reform, let the people pay for it. They put a burden on us that does not belong to us. I ask that that fee be entirely wiped out.

DR. W. A. JONES: I move that the State Association go on record as asking that the tax imposed on physicians by the Harrison Narcotic Act be removed.

DR. J. W. BELL: I do not think that the medical profession should ask a modification of the act to allow us to distribute more whiskey and liquor than we do now. I move that that part of the recommendation be stricken out.

A MEMBER: I second the motion.

THE PRESIDENT: That motion is considered as an amendment to Dr. Jones' motion, I believe.

A MEMBER: The morning after this action was taken over by the national association, the Chicago papers said that the American Medical Association had gone over to booze. I think it is high time to show that we have not done that. I do not see any reason for any more liquor than we have, unless we want to assume the duties of the former bartenders. It would be better to cut down the amount instead of increasing it.

THE PRESIDENT: A motion has been made and seconded that Dr. Jones' motion be accepted with an amendment. Those in favor signify by saying, Aye.

The vote was undecided and a rising vote was asked for.

DR. W. A. JONES: I want to waive that motion.

THE PRESIDENT: It cannot now be waived.

The motion was carried by a rising vote.

DR. WARREN: I wish to make my motion that the fee be entirely wiped out instead of brought down to \$1.00 and that the Association go on record as recommending that.

THE SECRETARY: A fee of \$3.00 is now charged for the privilege of dispensing narcotics. Efforts have been made by the American Medical Association at Washington to

bring it back to \$1.00. It would be better to request a reduction of the fee to \$1.00 on the grounds that it is now a tax on the physicians, whereas \$1.00 is necessary as a fee to handle that particular federal regulation.

DR. WARREN: There is no reason why the government should put a fee on us. It is not the amount. We do not want it at all. My opinion is that the whole thing is unconstitutional. Special taxes on physicians show discrimination. Such a tax should be carried by the whole nation. I should like to go on record as being opposed to this tax.

Motion was made and carried that the Association go on record as being opposed to the Harrison Narcotic Act entailing the payment of a fee by physicians.

A motion was made that the incoming president be empowered to appoint various committees.

Seconded and carried.

The President appointed a committee consisting of Dr. G. S. Wattam and Dr. George Douglas Head to notify the incoming president of his election and to escort him to the chair at the afternoon session.

DR. A. C. BAKER: In regard to the medical defense feature: we have to go over a period of five years before the present cases would be taken care of, do we not? I move that this feature be abolished.

DR. H. M. WORKMAN: That is an amendment and will have to lay over a year. This proposition has come before previous meetings. The House of Delegates has voted to retain the feature. It involves a change in the By-Laws and must be laid over until the next meeting.

As there was no further business to come before the meeting, on motion, duly seconded and carried, the House of Delegates adjourned *sine die*.

MINUTES OF THE SURGICAL SECTION

A. C. Strachauer, M.D., Chairman.

Verne C. Hunt, M.D., Secretary.

THURSDAY MORNING, OCTOBER 9th

The first meeting of the Surgical Section was held in the Sherman Theatre, St. Cloud, and was called to order at 8:45 A. M. by the Chairman, Dr. A. C. Strachauer.

Dr. Orville N. Meland, Warren, presented a paper on "The Treatment of Severe Injuries of the Scalp," which was discussed by Dr. H. P. Ritchie, St. Paul.

Dr. H. Waltman Walters, Rochester, read a paper entitled: "Obstructive Jaundice and Studies in Liver Function," which was discussed by Dr. A. A. Zierold, Minneapolis; Dr. A. C. Strachauer, Minneapolis; and in closing by Dr. Walters.

Dr. John F. Fulton, St. Paul, read a paper on "Foreign Proteins as Therapeutic Agents in the Treatment of Acute Ocular Inflammation." This was discussed by Drs. Paul Berrisford, St. Paul; W. R. Murray, Minneapolis; Carl Larsen, St. Paul; and again by Dr. Fulton.

Dr. Gilbert J. Thomas, Minneapolis, presented an essay entitled: "Preoperative Treatment of the Prostatic," which was discussed by Drs. H. C. Bumpus, Rochester; Edward Bratrud, Warren; W. F. Braasch, Rochester; Theodore Sweetser, Minneapolis; and in conclusion Dr. Thomas presented slides.

Dr. C. B. Lewis called attention to the two luncheons arranged for Friday noon, that of the alumni of the Univer-

sity of Minnesota, and that at the Country Club in honor of the ladies and such of the members as wished to attend. He also announced that the Commercial Club of St. Cloud were offering the services of their stenographer, free, to the members of the convention.

Dr. Carl C. Chatterton, St. Paul, presented a paper on "Acute Osteomyelitis in Children," which was discussed by Dr. M. H. Tibbetts, Duluth, whereupon Dr. Chatterton showed slides.

Dr. P. E. Stangl, St. Cloud, read an essay on "Perforating Gastric Ulcer," which was discussed by Drs. H. C. Cooney, Princeton; W. J. Mayo, Rochester; E. M. Jones, St. Paul; Verne C. Hunt, Rochester; A. M. Ridgway, Annandale; L. Sogge, Windom; W. H. Magie, Duluth; B. F. Van Valkenburg, Long Prairie; and in closing by Dr. Stangl.

Dr. Wm. R. Bagley, Duluth, read a paper on "Consideration of Various Abdominal Symptoms and Findings in Diagnosis," which was discussed by Dr. J. P. Schneider, Minneapolis, and again by Dr. Bagley.

Adjournment at 12:45.

MINUTES OF THE MEDICAL SECTION THURSDAY MORNING, OCTOBER 9th

E. L. Tuohy, M.D., Chairman
Chas. N. Hensel, M.D., Secretary

The Medical Section of the Minnesota State Medical Association's 56th Annual Session was called to order at 8:30 A. M. in the Knights of Columbus hall in St. Cloud by the chairman of the section as follows:

DR. TUOHY: There seems to be some misunderstanding as to the meeting hour today, but there is no misunderstanding as to the statement on this program, and you will do the Chairman a courtesy if you will pass the word along that tomorrow morning we shall begin at half past eight if there is only one man present.

The first paper to be read to this section this morning is one entitled "Differential Diagnosis of Pulmonary Disease" by Dr. M. George Milan, of Warren, Minnesota, and I now take great pleasure in calling upon Dr. Milan to address us.

Dr. Milan's paper was discussed by Dr. George D. Head, Minneapolis; Dr. L. A. Nippert, Minneapolis; Dr. H. Longstreet Taylor, St. Paul; and in closing by the essayist.

Dr. Everett K. Geer presented a paper entitled "Artificial Pneumothorax in Acute Lung Abscess," which was discussed by Dr. W. S. Lemon, Rochester; Dr. George D. Head, Minneapolis; Dr. M. George Milan, Warren; and Dr. Geer closing.

The paper on "Liver Functional Studies in Experimental Jaundice" was presented by Dr. A. M. Snell, of Rochester, and the paper on "Liver Functional Studies in Clinical Jaundice" was presented by Dr. Greene, of Rochester.

The two papers by Dr. Snell and Dr. Greene were discussed by Dr. Henry L. Ulrich, Minneapolis; Dr. Waltman Walters, Rochester; Dr. W. J. Mayo, Rochester; and in closing by the essayists.

Dr. F. W. Schlutz, Minneapolis, presented a paper entitled "Diabetes in Children." There was no discussion.

DR. TUOHY (Chairman): Members of the Section, on this occasion I wish on your behalf, as well as my own, in the presence of the Chairman of the local committee, to

thank the committee for the great care they have taken in preparing for us and giving us these splendid quarters and having at our disposal all the means of comfort that we are enjoying. This is the Knights of Columbus hall. I am a member of that order in Duluth, and I am pleased to note in St. Cloud there is the same spirit of religious and political serenity, because these colors above us are the colors of the Ku Klux Klan and it is to be seen that both orders are occupying the same hall as in Duluth. (Laughter.)

We have two more papers which will be discussed at the end of the second paper. First, "Practical Electrocardiography," by Dr. Harold E. Richardson, St. Paul, and "Electrocardiogram in the management of heart disease," by Dr. E. T. F. Richards, St. Paul.

The papers by Dr. Richardson and Dr. Richards were discussed by Dr. R. Edwin Morris, St. Paul; Dr. Olga S. Hansen, Minneapolis; Dr. H. Z. Giffin, Rochester; Dr. Frederick Mitchell, St. Paul; Dr. Henry L. Ulrich, Minneapolis.

Adjournment at 12:15 P. M.

GENERAL SESSION THURSDAY AFTERNOON, OCTOBER 9th

The convention met in general session in the Sherman Theatre at 2:00 P. M., Thursday, with Dr. A. C. Strachauer in the chair.

The program consisted of a symposium of papers on "Cancer" and was introduced by Dr. Margaret Warwick, St. Paul, with an illustrated talk on "Carcinomata as Shown by Paper Models Reconstructed from Serial Section."

Dr. Harold Robertson, Rochester, presented a paper entitled "Some Unusual Features of Carcinoma."

THE CHAIRMAN (Dr. Strachauer): We will now turn to the next paper. Dr. Ritchie for a number of recent years has been coming to our attention, particularly interesting himself in the service on malignancy at the University Hospital, and he has done a splendid outstanding piece of work. Individuals that have come to us regularly and whom we have had to inform that their cases were hopeless and there was nothing that we could do for them and whom we have had to send back home, ever since the doors of that hospital were opened, have sought his help. They have been people who were in a perfectly dreadful condition so far as they were concerned—not caring to live for themselves, let alone living with their families—and Dr. Ritchie has included these people in his series of cases, and we are fortunate in having a little glimpse into some of the work he is carrying on and that is being carried on under Dr. Ritchie in the consideration of destructive and constructive surgery in malignancy. Dr. Ritchie.

Dr. Harry P. Ritchie then presented his paper entitled "The Destructive and Constructive Surgery of Malignancy."

THE CHAIRMAN (Dr. Strachauer): The relative merits of radiolitic and surgical treatment of malignancy are so frequently presented by individuals who are working exclusively in one field or another, and in their great enthusiasm over their work in hand in my opinion overstate it, it is a great pleasure to have an authority like Dr. Mayo, who is so thoroughly familiar with the results being obtained, both in the radiolitic and the surgical therapy, and the results obtained in the combination of these methods, to

present us with the facts on this subject. I will now call upon Dr. W. J. Mayo to address us on the subject of "The Relative Value of Surgery and Radiotherapy."

Dr. Mayo's address was then delivered.

THE CHAIRMAN (Dr. Strachauer): Ladies and gentlemen, the next and last speaker is a member of the University Hospital also. He is pathologist of the University Hospital, thoroughly alive to malignant problems, and for the last half dozen years—possibly less—has given a considerable number of lectures before lay audiences as well as medical audiences. In addition to that he has put on several health shows, both for the University and for the Hennepin County Medical Society, also showing at the State Fair. So you see he has been on the firing line and is particularly qualified to present the subject of what the laity should know about cancer, and this audience knows that that is a subject that we are all interested in, and I want at the end of his presentation that you should feel at liberty to discuss it with Dr. O'Brien.

Dr. William A. O'Brien, Minneapolis, had chosen as his subject, "What the Laity Should Know About Cancer."

The meeting then adjourned.

MINUTES OF THE SURGICAL SECTION

A. C. Strachauer, M.D., Chairman.

Verne C. Hunt, M.D., Secretary.

FRIDAY MORNING, OCTOBER 10th

The second session of the Surgical Section was called to order by the Chairman in the Sherman Theatre at 8:50 A. M.

Dr. W. L. Burnap, Fergus Falls, presented a paper on "The Silent Antrum," which was discussed by Drs. Horace Newhart, Minneapolis; J. T. Schlesselman, Mankato; W. E. Camp, Minneapolis.

Dr. Emil C. Robitshek, Minneapolis, read an essay entitled: "Surgical Accidents in Simple Inguinal Hernioplasty," which was discussed by Drs. G. G. Eitel, Minneapolis; Gustav Schwyzer, Minneapolis; A. R. Colvin, St. Paul; and Arthur N. Collins.

Dr. M. S. Henderson, Rochester, read an essay entitled: "Arthroplasties," which was discussed by Dr. Emil S. Geist, Minneapolis, and Dr. A. R. Colvin, St. Paul, and in closing by the essayist.

Dr. Emil F. Geist, Minneapolis, presented a paper on "Fractures of the Spine." In the discussion the following participated: Drs. M. S. Henderson, Rochester; A. T. Mann, Minneapolis; B. S. Adams, Hibbing; A. R. Colvin, St. Paul; and Dr. Geist in closing.

Dr. D. C. Balfour, Rochester, read a paper on "Relative Merits of the Different Surgical Procedures for Duodenal Ulcer," which was discussed by Drs. A. C. Strachauer, Minneapolis; A. T. Mann, Minneapolis; T. L. Chapman, Duluth; S. Marx White, Minneapolis; C. M. Roan, Minneapolis; and in closing by Dr. Balfour.

A joint paper by Dr. Arthur N. Collins and Fred Ritz, Bacteriologist, Duluth, on "Tracing Infections in a Surgical Service," was read by Dr. Collins. Dr. Wm. C. Carroll, St. Paul, and Dr. Theodore Sweetser, Minneapolis, discussed the paper, after which Dr. Collins concluded.

Dr. C. Alexander Hellwig, Frankfort-am-Main, Germany (in St. Cloud temporarily), presented a paper entitled: "Anesthesia in Goiter Operations at the Schmieden Clinic."

The Surgical Section then adjourned at 12:30.

MEDICAL SECTION

FRIDAY MORNING, OCTOBER 10th

E. L. Tuohy, M.D., Chairman

Chas. N. Hensel, M.D., Secretary

THE CHAIRMAN (Dr. Tuohy): The first paper this morning is by Dr. T. B. Tuttle, of the Veterans' Bureau, on the subject of Amebiasis. This is a very splendid contribution to this section and I would suggest that in discussing this you will remember that the benefit to be derived from this paper must be twofold. It must be not only what is communicated to you men who are here today, but the discussion should be in such form that the reporter may take it down in order that it may be published. There are many points of very great practical interest here, because most of us have not had our attention drawn to this matter and do not make proper stool examinations—do not attempt to properly differentiate the symptoms the patient has—and there is much obscurity as to treatment. Therefore, in opening the discussion, if you will have this point in mind we will be able to have a very good report of the benefits to be derived from this paper. I will call upon Dr. Tuttle.

Dr. Tuttle's paper entitled "Amebiasis" was discussed by Dr. Oriana McDaniel, Minneapolis; Dr. L. W. Pollock, Rochester; Dr. S. Marx White, Minneapolis; Dr. Moses Barron, Minneapolis; and in closing by the essayist.

DR. TUOHY (Chairman): Those who discuss the papers read here will get back a transcript of what they are presumed to have said. I noticed when Dr. Pollock was talking his words did not come over here very good. Let me urge you to do this when your reports come back; make an effort to bring into the report of the paper that which is actually occurring here.

I must tell you of a reporter who once reported a public man of very great prominence, whose words had great effect on the community as a whole. The reporter late in the evening, after a pre-Volstead bibulous dinner, awakened this chap, and indeed it was very early in the morning, and said:

"Perhaps you would like to have me read to you the report I made of your speech, because this is going forth and I thought it might be a courtesy to you to see it," and the man got out of bed and began to read what he had said, and he said:

"My God, man! This is awful. This is what I said," and he forthwith put down a very stirring and lucid statement, and as the reporter left the room he said: "Young man, I want to give you some advice. Never presume as long as you live to report a public man when you are drunk." This does not apply to our reporter that is here today. This is for the edification of those who wish to have a correct report go forth of what is being reported from this meeting. We have splendid discussions, but they don't always come back in good shape from the wash.

We will next listen to a paper by Dr. H. Z. Giffin, of Rochester, on the subject of "Hemorrhagic Pupura."

Those who discussed Dr. Giffin's paper were Dr. S. Marx White, Minneapolis; Dr. J. P. Schneider, Minneapolis; Dr. T. H. Sweetser, Minneapolis; Dr. Moses Barron, Minneapolis; and in closing by Dr. Giffin.

Dr. Ball read an essay entitled "Some Observations Concerning Tic Douloureux After Sixteen Years' Experience," which was discussed by Dr. A. S. Hamilton, Minneapolis;

Dr. J. C. Michael, Minneapolis; Dr. J. P. Schneider, Minneapolis; and in closing by the essayist.

Dr. W. H. Hengstler, St. Paul, presented a paper on the subject of "The Role of Infections in Nervous Disease," which was discussed by Dr. Henry W. Woltmann, Rochester; Dr. A. S. Hamilton, Minneapolis; Dr. Hengstler, in closing.

Dr. A. E. Flagstad, St. Paul, presented a paper entitled "Diathermy in Vascular Circulatory Disturbances and Arthritis." This paper was discussed by Dr. P. G. Boman, Duluth; Dr. G. S. Wattam, Warren; Dr. A. U. Desjardins, Rochester; Dr. J. C. Boehm, St. Cloud.

Dr. Paul O'Leary, Rochester, presented a paper entitled "Cutaneous Picture of Late Syphilis," which was discussed by Dr. S. Sweitzer, Minneapolis, and Dr. J. C. Michael, Minneapolis.

DR. TUOHY (Chairman): Two men on the program do not get a fair deal; those who give the first papers in the medical and surgical sections, and particularly those men on the last part of the program, and so upon an occasion like this the whole-hearted sympathy goes forth to Dr. Barron, who gives his time to the preparation of a paper of this kind and comes into the meeting at the close. I take full credit for being responsible, but as we go over the morning session it seems a crime to stop these discussions, and no man is better fitted to accept this position on the program and maintain his dignity than Dr. Barron. We will call on him to come forth and make it snappy.

Dr. Moses Barron, Minneapolis, presented his paper entitled "Diseases of the Pancreas."

DR. HEAD: Mr. Chairman, while I have many notes of interest and importance that I might bring forward, I will resign my time in this discussion to some of the other men who have something interesting to discuss.

DR. TUOHY (Chairman): Will you submit the discussion in writing and send it in?

DR. HEAD (Minneapolis): I will be glad to.

DR. CROSS (Minneapolis): It is late, Mr. Chairman. I think it is very unfortunate. We will, of course, write a discussion later. If there was time I would like to detail some cases, but I think I will forego that and write my discussion also. It is so late, and we all want to get away.

DR. TUOHY (Chairman): Will you write them out? I think that is the better suggestion. You are all uneasy. Let the gentlemen write them out and let them be incorporated in the publication.

I thank you for your patience in remaining. We are all off to luncheon, and then for the General Session at two o'clock.

The section adjourned.

GENERAL SESSION

FRIDAY AFTERNOON, OCTOBER 10th

The convention met in general session in the Sherman Theatre at 2:25 P. M., Friday, with Dr. H. M. Workman in the chair.

THE CHAIRMAN: This is the first time in my experience of forty years that the President of the Minnesota State Medical Association has not been able to be present to preside at the convention. The job has been passed on in the manner of "Let George do it," so it has been up to the President of the Council to open this session. I will therefore

called on Dr. Drake to read the Report of the House of Delegates.

THE SECRETARY: At the request of the President, Dr. Archibald MacLaren, who was unable to be here, I will read the following communication which was sent to the Association:

"It is with feelings of the deepest regret that I find it will be impossible for me to attend the meeting of the Minnesota State Medical Association at St. Cloud. Never having suffered from a severe illness before, it has seemed, from week to week, that I would surely be able to be with you at this time. In this hope, however, I am doomed to disappointment in spite of the excellent care given me by my skillful medical advisors. They assure me that before long I shall be out again and then it will be with the most heartfelt pleasure that I shall greet my old friends again. I wish to express at this time, my keenest interest in the meeting and to send to you my best wishes for its great success.

DR. ARCHIBALD MACLAREN."

The registration up to the present time is 295 out of a total membership of 1,952. This 1,952 represents a gain in membership during the past year of 68. The financial status of the Association is somewhat better than it was a year ago, the Treasurer's report showing a net gain of about \$500.

The House of Delegates met twice and the Council twice, and the following is in brief what was accomplished.

The House of Delegates recommended to the Program Committee that the next program embody more general meetings and fewer sectional meetings, and that the papers be read largely in abstract rather than have the entire paper presented, the idea being that the full paper should be published. The House of Delegates endorsed the Northwestern Health Journal, a periodical which, as you know, is for the laity.

At the request of the House of Delegates, the Council combined three committees; that is, the Cancer Committee, the Publicity Committee, and the Public Health Committee are to be amalgamated into a Public Health Committee. The question of the discontinuance of the medical defense feature of our constitution was brought up and will be voted upon at the next meeting, a year from now.

At the election of officers yesterday morning the following were elected for the calendar year 1925: President, Dr. W. L. Burnap, of Fergus Falls; First Vice President, Dr. A. S. Hamilton, of Minneapolis; Second Vice President, Dr. John Libert, of St. Cloud; Third Vice President, Dr. C. W. Moore, of Eveleth. The present Secretary and Treasurer were continued. The Councillors: First District, Dr. G. S. Wattam, of Warren; Third District, Dr. H. L. Taylor, of St. Paul; Fourth District, Dr. W. H. Condit, of Minneapolis, to succeed himself; Seventh District, Dr. F. A. Dodge, of LeSueur, to succeed himself. The Delegates to the American Medical Association: Dr. Rothrock was elected for two years, and Dr. Chapman, of Duluth, for two years. Dr. Litzenberg is the third Delegate, and he continues for another year. As Alternates: Dr. Cross, of Minneapolis, was elected for two years and Dr. Theodore Bratrud, of Warren, for two years. It was decided to hold the next meeting in Minneapolis, and tentatively the time of meeting was set by the Council as the second week of October, 1925.

THE CHAIRMAN: Is there anything further to come before this assembly? The committee appointed yesterday to present the president-elect, Dr. Wattam and Dr. Head, will present the president.

DR. WATTAM: Mr. President and Members of the Minnesota Medical Association: I have great pleasure in presenting to you Dr. W. L. Burnap, of Fergus Falls, who has been duly elected as your President and executive officer for the coming year. In selecting Dr. Burnap as your President I feel that you have done a great honor at this time to the medical profession of northwest Minnesota, and we who have known Dr. Burnap and known of the work that he has done for this Association, especially northern Minnesota, feel that you have as well honored this Association by the selection that was made by the House of Delegates yesterday. I have pleasure in presenting Dr. Burnap.

THE PRESIDENT (Dr. W. L. Burnap): Members of the Minnesota State Medical Association, Friends, Mr. Chairman: You little know the embarrassment which I feel in standing before this gathering of men, most of whom are so much more capable and worthy than I of accepting this high honor and the responsibilities of this office. It has come so unexpectedly and with at the present time such a heavy weight that I feel it impossible just now to say anything which would be of special interest or delight to you. I could not if I should try convey to you my feelings of pride and heartfelt gratification that these splendid men of northern Minnesota saw fit to present me as their representative in this Association. I will say nothing of this fine gentleman who, as I understand, made the no minuting speech. I don't like to suggest that possibly it was not entirely unselfish because he grabbed off my position of councilor as soon as I was out of the way. Nevertheless, northern Minnesota has handed this Association a package which I am sure most of you will feel is of doubtful value.

We are proud of the profession of northern Minnesota. We are proud of the advances it has made, especially during the last few years. We are proud of Duluth, our metropolis and our chief medical center. But I am glad to say that our interest does not cease there. We are proud of our University; we are proud especially of its medical department. We are proud of the accomplishments of its undergraduate and postgraduate departments; and we glory in its promise of a brilliant future. We are proud of the high character and great attainments of the profession of the Twin Cities, and I wish again at this time to extend to them our thanks for their many courtesies. We are proud and truly grateful that fate gave to Minnesota the two Mayos and permitted them to gather at Rochester the greatest group of medical authorities and specialists this world has ever known.

And so, feeling as we do, we of northern Minnesota are especially pleased that you have given us an opportunity for one year to serve the entire profession of this great state of Minnesota; and whatever the accomplishments of this year may be, the Minnesota State Medical Association can be assured that we will have given it the best that we have to give.

recognizing a simple proposition in physics, that an engine that uses all its steam in whistling has no power with which to turn the wheels, I will cut off the exhaust and proceed to work.

DR. E. L. TUOHY (as Chairman): The combined session will proceed with the program. We have the very good fortune to have with us as a guest from the Department of Zoology of the University of Chicago, Dr. Carl R. Moore. I take great pleasure in introducing Dr. Moore at this time.

Dr. Carl R. Moore, Chicago, read a paper entitled: "The Behavior of the Testes Under Varying Experimental Conditions and the Function of the Scrotum; Transplantation Cryptorchidism and Vasectomy." Dr. F. C. Rodda, Minneapolis, and Dr. C. N. Hensel, St. Paul, commented on the paper.

THE CHAIRMAN: It is my pleasant opportunity to thank the Local Committee on behalf of this Association and to express to them our very great appreciation, first for the invitation here to St. Cloud, second for the masterly way in which they have arranged their committees and have carried on this meeting, and then for the very fine comfort that we have had both as to the place of meeting and the excellent hotel accommodations, and further for the very kindly, cordial and fraternal relationship that the medical men have extended to us, and most of all the extremely cordial reception that we had from their wives and friends at the entertainment of last night. We will all go home feeling that St. Cloud is one of our very notable Minnesota centers and that we will hope to come back again. I am not sure what the precedent is on an occasion like this, but I believe a motion to carry such a resolution would be in order.

DR. J. G. C. : I move that the assembly by a rising vote attempt in that way to thank the profession of St. Cloud for their entertainment of this year.

(Motion seconded and carried.)

Dr. Lawson G. Lowrey, Minneapolis, read a paper on "Child Guidance."

Dr. O. W. Rowe, Duluth, presented a paper on "Routine Examination of the New Born," which was discussed by Drs. F. C. Rodda, Minneapolis; W. R. Ramsey, St. Paul; August Kuhlmann, Melrose; and in closing by Dr. Rowe.

Dr. Albert G. Schulze, St. Paul, read a paper entitled: "Differential Diagnosis of the Preeclamptic Toxemias and Nephritic Toxemias of Pregnancy," which Dr. W. A. Coventry, Duluth, discussed.

Dr. Henry Wireman Cook, Minneapolis, presented his paper on "Periodic Physical Examinations" very briefly, the hour being late.

THE CHAIRMAN: I feel that this subject that Dr. Cook has brought before you briefly today without sufficient audience is of great importance, and I hope that with the publication of this paper interest will be awakened and a greater opportunity for the presentation of this subject before a larger audience will be had next year. I feel that those of you who have had the courage to stay through this program and thus show your interest should have the appreciation of the chairman of this section, and that those of the essayists who had to stay and bear the brunt of the dwindling audience likewise owe the appreciation of the chairman.

This concludes the afternoon's program. The health movie has not arrived. With your permission the annual meeting of the Minnesota State Medical Association stands adjourned.

Adjournment.

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